DICOM Conformance Statement

syngo CT VB10A

Product Name
NAEOTOM Alpha
SOMATOM X.ceed SOMATOM X.cite
SOMATOM go.All SOMATOM go.Fit SOMATOM go.Now SOMATOM go.OpenPro SOMATOM go.Sim SOMATOM go.Top SOMATOM go.Up
SOMATOM Pro.Pulse
SOMATOM On.Site

The DICOM Conformance Statement is also valid for regional product variants and configurations.

1 Conformance Statement Overview

syngo CT VB10A supports storing DICOM images to remote nodes like workstations or Archiving Systems. Using the Storage Commitment Service it can request safe keeping of previously stored instances from an Archiving System. Additionally the syngo CT VB10A can query remote notes, retrieve, and store selected instances from that node. Using the Modality Worklist (MWL) service syngo CT VB10A can query a HIS/RIS for scheduled procedures. Performed procedure status and other procedure data can be returned to the HIS/RIS using the Modality Performed Procedure Step (MPPS) Service. Furthermore printing of color and grayscale images is supported.

The syngo CT VB10A conforms to the DICOM Standard and supports the network services as described in Table 1: Network Services and the media services as described in Table 2: Media Services

Table 1: Network Services

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)	
		Send	Store	Display
Transfer				
SOP Classes created by syngo CT VB10A				
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	Yes
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes	Yes
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	Yes
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	Yes
RT Structure Set Storage [1]	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes	Yes
Surface Segmentation Storage [2]	1.2.840.10008.5.1.4.1.1.66.5	Yes	Yes	No
SOP Classes managed by syngo CT VB10A				
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes	Yes
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes	Yes

[1] Part of RT Image Suite: Create of RT Structure Set is not available on CT Naeotom Alpha and SOMATOM On.Site

[2] Part of RT Image Suite: Create of Surface Segmentation Storage is not available on CT Naeotom Alpha and SOMATOM On.Site

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)	
		Send	Store	Display
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes	Yes
Digital Intra-Oral X-Ray Image - for Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes	Yes
Digital Intra-Oral X-Ray Image - for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes	Yes
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	Yes	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes	Yes
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	Yes	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	Yes	No
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	Yes	Yes	No
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	Yes	Yes	No
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	Yes	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)	
		Send	Store	Display
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes	Yes
Grayscale Planar MPR Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.6	Yes	Yes	Yes
Compositing Planar MPR Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.7	Yes	Yes	Yes
Advanced Blending Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.8	Yes	Yes	Yes
Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.9	Yes	Yes	Yes
Segmented Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.10	Yes	Yes	Yes
Multiple Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.11	Yes	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	Yes	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes	Yes
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes	Yes
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Yes	Yes	Yes
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes	Yes
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes	Yes

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)	
		Send	Store	Display
Radiopharmaceutical Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.68	Yes	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	Yes	No
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	Yes	No
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	Yes	No
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	Yes	Yes	Yes

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Transfer (Private SOP Class)			
Syngo Non-Image Storage	1.3.12.2.1107.5.9.1	Yes	Yes
Workflow Management			
Storage Commitment Push Model SOP	1.2.840.10008.1.20.1	Yes	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Query/Retrieve			
Study Root Query/Retrieve – Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve – Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	No	Yes
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	No	Yes
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	No	Yes
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	No	Yes
Print Management			
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Print Job SOP Class	1.2.840.10008.5.1.1.14	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No

- SOP classes managed: provide services out of Send, Store, Display
- SOP classes created: SOP classes managed PLUS objects are initially created.

Table 2: Media Services

Media Storage Application Profile	FSC	FSR	FSU
Compact Disk – Recordable			
STD-GEN-CD	Yes[1)]	No	No
AUG-GEN-CD	Yes	Yes	No
DVD			
STD-GEN-DVD-RAM	Yes[1)]	No	No
STD-GEN-DVD -JPEG	Yes[1)]	No	No
STD-GEN-DVD -J2K	Yes[1)]	No	No
AUG-GEN-DVD-RAM	Yes	Yes	No
Blue Ray			
STD-GEN-BD	Yes[1)]	No	No
STD-GEN-BD- JPEG	Yes[1)]	No	No
STD-GEN-BD- J2K	Yes[1)]	No	No
AUG-GEN-BD-JPEG	Yes	Yes	No
AUG-GEN-BD-J2K	Yes	Yes	No
USB			
STD-GEN-USB	Yes[1)]	No	Yes[1)]
STD-GEN-USB-JPEG	Yes[1)]	No	Yes[1)]
STD-GEN-USB-J2K	Yes[1)]	No	Yes[1)]
AUG-GEN-USB-J2K	Yes	Yes	Yes

[1)] The STD profiles only apply if High Profile Data Minimization is applied (which removes all the Private DICOM Attributes). This can be combined with any compression setting (except for STD-GEN-CD).

Table 3: Implementation Identifying Information

Name	Value
Application Context Name	1.2.840.100008.3.1.1.1
Implementation Class UID	1.3.12.2.1107.5.1.7

Name	Value
Implementation Version Name	SIEMENS_S10VB10A

2 Table of Contents

1 CONFORMANCE STATEMENT OVERVIEW 2

2 TABLE OF CONTENTS 8

3 INTRODUCTION 11

3.1 Revision History 11

3.2 Audience 13

3.3 Remarks 13

3.4 Terms and Definitions 13

3.5 Basic of DICOM Communication 14

3.6 Abbreviations 15

3.7 References 16

4 NETWORKING 17

4.1 Implementation Model 17
4.1.1 Application Data Flow 17
4.1.2 Functional Definitions of Aes 19
4.1.3 Sequencing of Real World Activities 20

4.2 AE Specifications 23
4.2.1 Common AE Specifications 24
4.2.2 Storage AE Specification 26
4.2.3 Storage Commitment AE Specification 31
4.2.4 Query/Retrieve AE Specification 34
4.2.5 Modality Worklist AE Specification 43
4.2.6 Modality Performed Procedure Step AE Specification 50
4.2.7 Print AE Specification 55

4.3 Network Interfaces 66
4.3.1 Physical Network Interface 66
4.3.2 Additional Protocols 66
4.3.3 IPv4 and IPv6 Support 66

4.4 Configuration 67
4.4.1 AE Title/Presentation Address Mapping 67
4.4.2 Configuration Parameters - Explanation 68
4.4.3 General Configuration Parameters 69
4.4.4 Configuration of DIMSE Services 69
4.4.5 Basic Worklist Management Service Configuration 70

4.4.6 Modality Performed Procedure Step Service Configuration 71
4.4.7 Storage Service Configuration 72
4.4.8 Storage Commitment Service Configuration 73
4.4.9 Query/Retrieve Service Configuration 74
4.4.10 Print Management Service Configuration 75
4.4.11 Configuration of DICOM Web Services **Error! Bookmark not defined.**
4.4.12 Configuration of Media Storage Service 76
4.4.13 Configuration of Real Time Video Service **Error! Bookmark not defined.**
4.4.14 Configuration of Audit Trail - Syslog 76
4.4.15 Support of DICOM Supplement 188 77

5 MEDIA INTERCHANGE 78

5.1 Implementation Model 78
5.1.1 Application Data Flow Diagram 78
5.1.2 Functional Definitions of AEs 78
5.1.3 Sequencing of Real World Activities 79
5.1.4 File Meta Information for Implementation Class and Version 79

5.2 AE Specifications 80
5.2.1 Media Storage AE – Specification 80

5.3 Augmented and Private Application Profiles 82

5.4 Media Configuration 82

6 TRANSFORMATION OF DICOM TO CDA 83

7 SUPPORT OF EXTENDED CHARACTER SETS 84

8 SECURITY 87

8.1 Security Profiles 87
8.1.1 Basic TLS Secure Transport Connection Profile 87

8.2 Association Level Security 87

8.3 Application Level Security 87
8.3.1 Attribute confidentiality profiles – Data Minimization 87

9 ANNEXES 98

9.1 IOD Contents 98
9.1.1 Created SOP Instances 98
9.1.2 Usage of Attributes from received IODs 145
9.1.3 Attribute mapping 145
9.1.4 Coerced / Modified fields 145

9.2 Data Dictionary of Private Attributes 146

9.3 Coded Terminology and Templates 163
9.3.1 Context Groups 163
9.3.2 Template Specifications 163
9.3.3 Private Code definitions 171

9.4 Grayscale Image Consistency 173

9.5 Standard Extended / Specialized / Private SOP Classes 173
9.5.1 Standard Extended / Specialized / Private SOP CT Image 173
9.5.2 Standard Extended / Specialized / Private SOP Secondary Capture Image 173
9.5.3 Standard Extended / Specialized / Private SOP Segmentation 173

9.6 Private Transfer Syntaxes 173

9.7 DICOM Print SCU – detailed status displays 174
9.7.1 Common Status Information 174
9.7.2 Additional DICOM Execution Status Information 179

ANNEX A: INDEX OF TABLES 180

ANNEX B: TABLE OF FIGURES 182

3 Introduction

3.1 Revision History

Version	Date	Product Version	Change
1.0	2020-06-11	Somaris/10 VA40A	Usage of new DCS Template Fix Value, Presence of Value and Source issues in all module tables Add Referenced Study Sequence in Table 76 Add missing DICOM Attributes in Table 77 Add notes in Value in Table 84 Add new Filter types in Table 85 Add new Exposure Modulation Types in Table 85 Add (0018,9361) in Table 85 Add missing Image Type in Table 85 Add 9.1.2.11.2 (Supplement 188) Add 9.1.2.11.3 & 9.1.2.11.4 (Supplement 188) Add hint in 9.1.2.12 for Multi Frame images Add 9.1.2.15 Multi-Energy CT Image Module Add Table 98 Add Table 99 Add Table 100 Add 9.1.4.4.1 & 9.1.4.4.2 Image Type Values Add 9.1.4.6 Image Plane Module Add hint in 9.1.4.9 for Multi Frame images Add 9.1.7 Spatial Registration
1.1	2022-02-17	Somaris/10 VA40A SP2	Fix inadequate documentation of capabilities in Table 1 (no changes in implementation): • SOP Classes managed by Somaris/10: Move Raw Data Storage Class from created to managed section (Raw Data Storage SOP Class header only used internally), no Display supported • SOP Classes managed by Somaris/10: Set Created flag to False for all SOP classes in that section which was incorrectly set to True before • SOP Classes managed by Somaris/10: Set Display flag for all Waveform SOP Classes to False, which was incorrectly set to True before • SOP Classes managed by Somaris/10: Set Display flag for some RT SOP classes to False which were incorrectly set to True before • Query / Retrieve (adaptions also in chapter 4.2.4.3.1): Only Study Root Q/R – Information Model – FIND/MOVE are supported (SCU and SCP) Corrected UIDs of Q/R SOP Classes Added a note in chapter 9.1.3 that Raw Data Storage SOP class is only used internally by the SW (see above). Added description for RT Structure Set Storage SOP class in chapter 9.1.1.8 Fix Table numbering
2.0	2022-05-10	Somaris/10 VA50A	Usage of Brandville DCS template. Fix inadequate documentation of capabilities in Table 1 (no changes in implementation): • SOP Classes managed by Somaris/10:

Version	Date	Product Version	Change
			Move Segmentation Class from created to managed section • SOP Classes managed by Somaris/10: Move Spatial Registration Storage Class from managed to created section Add CT_SOM8 DEMEP as Image Type Value 4 in 9.1.2.13.1 Explain Image Types for NAEOTOM Alpha in 9.1.2.11.2 Add Structured Reporting Templates ID (PS3.16) in 9.3.2 Add UI values in table 34 Add info about switch on/off option for Supplement 188 Add Japanese in table 70 Add profile dependent de-identification for raw data table Add General Acquisition and Reference module in 9.1.2 Add missing attributes in chapter 9 Remove Scan Range Data module in 9.1.3 Fix missing Private Code Definitions in 9.3.3 Fix issues in figures Fix issues in chapter 9
3.0	2023-09-25	Somaris/10 VB10A	Changes in platform template: - Adding N-CREATE and N-SET message content Tables - Data Flow Diagram has been re-worked - Print diagram was removed - Renaming chapters in the Association Acceptance Policy of the Print AE - Sub-chapters added to the Association Acceptance Policy of the Query/Retrieve AE - Added capability for Storage Commitment SCP and Query/Retrieve SCP - Updating supported compression methods (YBR), chapter Proposed Presentation Contexts - Add chapter 4.2.3.3.2 Activity “Send Reply to Initial Storage Commitment Request” - Add attributes in sections of 4.2.6 Finished transition from SRT to SCT according to DICOM change proposal 1850 Extend list of scanners on cover page Add Image type CT_SOM 3DCAM and adapt image DICOM tags for RGB images in case of 3D camera images in 9.1.1.3.5.1 Add 9.1.1.9 Surface Segmentation SOP Class Add 9.1.1.6.4 SR Document General Module Add 9.1.1.69.1.1.6 Comprehensive SR Add TID 10014 Add filter type IMAGE in 9.1.1.3.5.1 Restructure chapter 9 acc. to template Renaming chapter 7.1 and 7.2 (from De-Identification to Data Minimization
3.1	2024-02-29	Somaris/10 VB10A	- Table 1: Changed SCP to "No" for Storage Commitment Push Model SOP to conform to implementation. Chapters below 4.2.3. describing the SCP were adapted/removed. - Corrected documentation of supported Media Storage Application Profiles (Table 2, Chapter 5.2.1) - Improved documentation of the Verification SOP Class in 4.2.1 - Corrected documentation of Q/R SCP: Support for Matching Keys on Instance Level; Added missing Information Models. - Corrected some small inconsistencies, formatting & spelling issues - Extended the Configuration chapter 4.4 - adding missing configuration items - Correct (0018,0015) Body Bart Examined in Table 99: General Series Module – CT Image acc. to CP-2232 (only documentation issue)

3.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between this product and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of conformance statements is the first step towards assessing interconnectivity and interoperability between syngo CT VB10A and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

Siemens Healthineers reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens Healthineers representative for the most recent product information. The current versions of Siemens Healthineers DICOM conformance statements can be found at:

https://www.siemens-healthineers.com/services/it-standards/dicom

3.4 Terms and Definitions

The following table gives an overview about frequently used terms in this document.

Table 4: Terms and Definitions

Term	Definition
Abstract Syntax	The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity (AE)	A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities.
Application Entity Title (AET)	The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between Application Entities. Example: DICOM network protocol.
Association	A network communication channel set up between Application Entities.
Attribute	A unit of information in an Information Object Definition; a Data Element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Data Element	A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly
Information Object Definition (IOD)	The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).

Term	Definition
Multi-Study	Multi-Study Exam: A combined examination for which more than one Requested Procedure was scheduled, each RP resulting in a separate study.
Module	A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient' Birth Date, and Patient's Sex.
Negotiation	First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.
Presentation Context	The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.
Private SOP Class	A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement.
Protocol Data Unit (PDU)	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.
Service Class Provider (SCP)	Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU)	Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and Modality Worklist AE SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class (SOP Class)	The specification of the network or media transfer (service) of a particular type of data (object) ; the fundamental unit of a DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance (SOP Instance)	An information object; a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image.
Specialized SOP Class	A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes, by enumeration of specific permitted Values for Attributes, or by enumeration of specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes.
Standard SOP Class	A SOP Class defined in the Standard, and that is implemented and used without any modifications.
Standard Extended SOP Class	A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes.
Tag	A 32-bit identifier for a Data Element, represented as a pair of four-digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
Transfer Syntax	The encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation.
TLS-Secured Port	TCP port on which an implementation accepts TLS connections to exchange DICOM information.
Unique Identifier (UID)	A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
Value Representation (VR)	The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR) ; with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Basic of DICOM Communication

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in italics below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two Application Entities (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network "handshake". One of the two devices must initiate an Association

(a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (Negotiation).

DICOM specifies a number of network services and types of information objects, each of which is called an Abstract Syntax for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted Transfer Syntaxes. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called Presentation Contexts. The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on Roles – which one is the Service Class User (SCU – client) and which is the Service Class Provider (SCP – server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (PDU) size, security information, and network service options (called Extended Negotiation information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports) and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate Information Object Definition and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a Response Status indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a Media Application Profile that specifies “pre-negotiated” exchange media format, Abstract Syntax, and Transfer Syntax.

3.6 Abbreviations

Definitions, terms, and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
ALWAYS	Attribute is always present with a value Module is always present
ANAP	Attribute not always present
ASCII	American Standard Code for Information Interchange
AUTO	Attribute value is generated automatically
CONDITIONAL	Module is used under specified condition
CONFIG	Attribute value source is a configurable parameter
COPY	Attribute value source is another SOP instance
DCS	DICOM Conformance Statement
DICOM	Digital Imaging and Communications in Medicine
DT	Defined Term
EMPTY	Attribute is always present without any value (attribute sent zero length)
EV	Enumerated Value
FIXED	The attribute value is hard coded in the application
FSC	File Set Creator
FSR	File Set Reader

FSU	File Set Updater
GSDF	Grayscale Standard Display Function
HIS	Hospital Information System
IHE	Integrating the Healthcare Enterprise
IOD	DICOM Information Object Definition
ISO	International Standard Organization
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist Attribute value source is a Modality Worklist (in 9.1)
N/A	not applicable
NEMA	National Electrical Manufacturers Association
O	Optional Attribute
PACS	Picture Archiving and Communication System
PDU	DICOM Protocol Data Unit
R	Required Attribute
RIS	Radiology Information System
SC	Secondary Capture
SCP	DICOM Service Class Provider (DICOM Server)
SCT	SNOMED CT (Systematized Nomenclature of Medicine Clinical Terms)
SCU	DICOM Service Class User (DICOM Client)
SOP	DICOM Service-Object Pair
SR	Structured Report
SRT	SNOMED-RT (Reference Terminology)
SSO	Surface Segmentation Object
TFT	Thin Film Transistor (Display)
TID	Template ID
U	Unique Key Attribute
UID	Unique Identifier
USB	Universal Serial Bus
USER	The attribute value source is explicit user input
UTF-8	Unicode Transformation Format-8
VNAP	Value not always present
VR	Value Representation
VT	Value Type
WS	Workstation

3.7 References

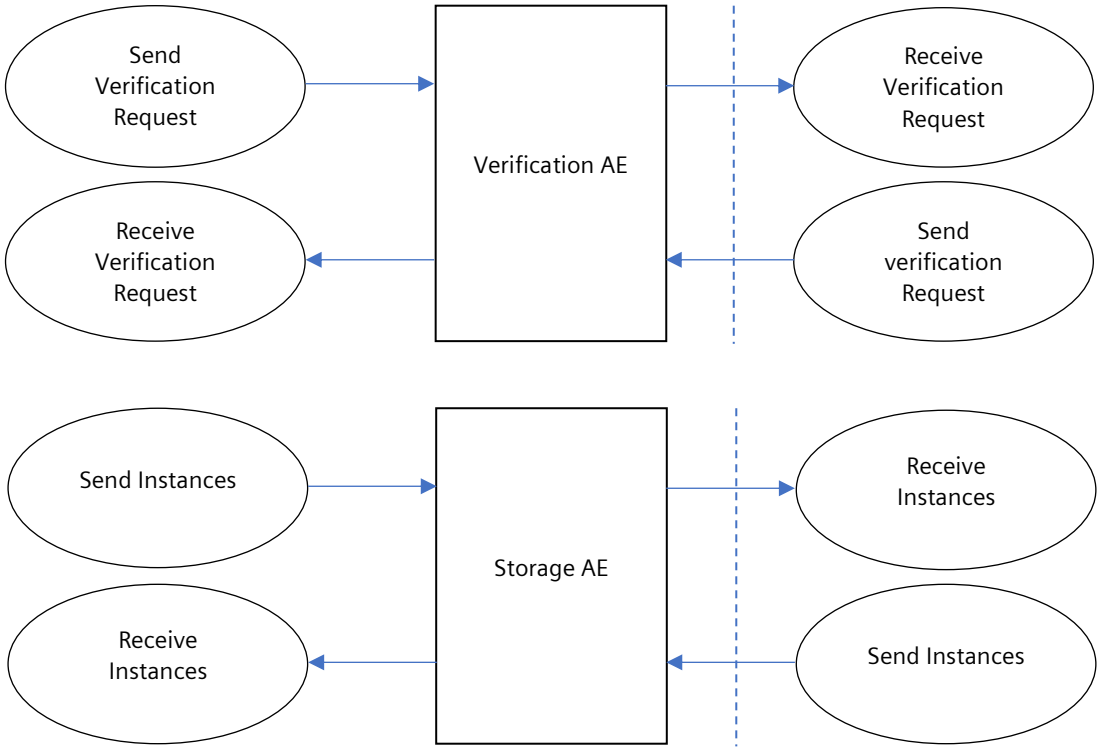
[1] NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (Available free at https://www.dicomstandard.org/)
[2] „Integrating the Healthcare Enterprise," [Online]. Available: http://www.ihe.net.

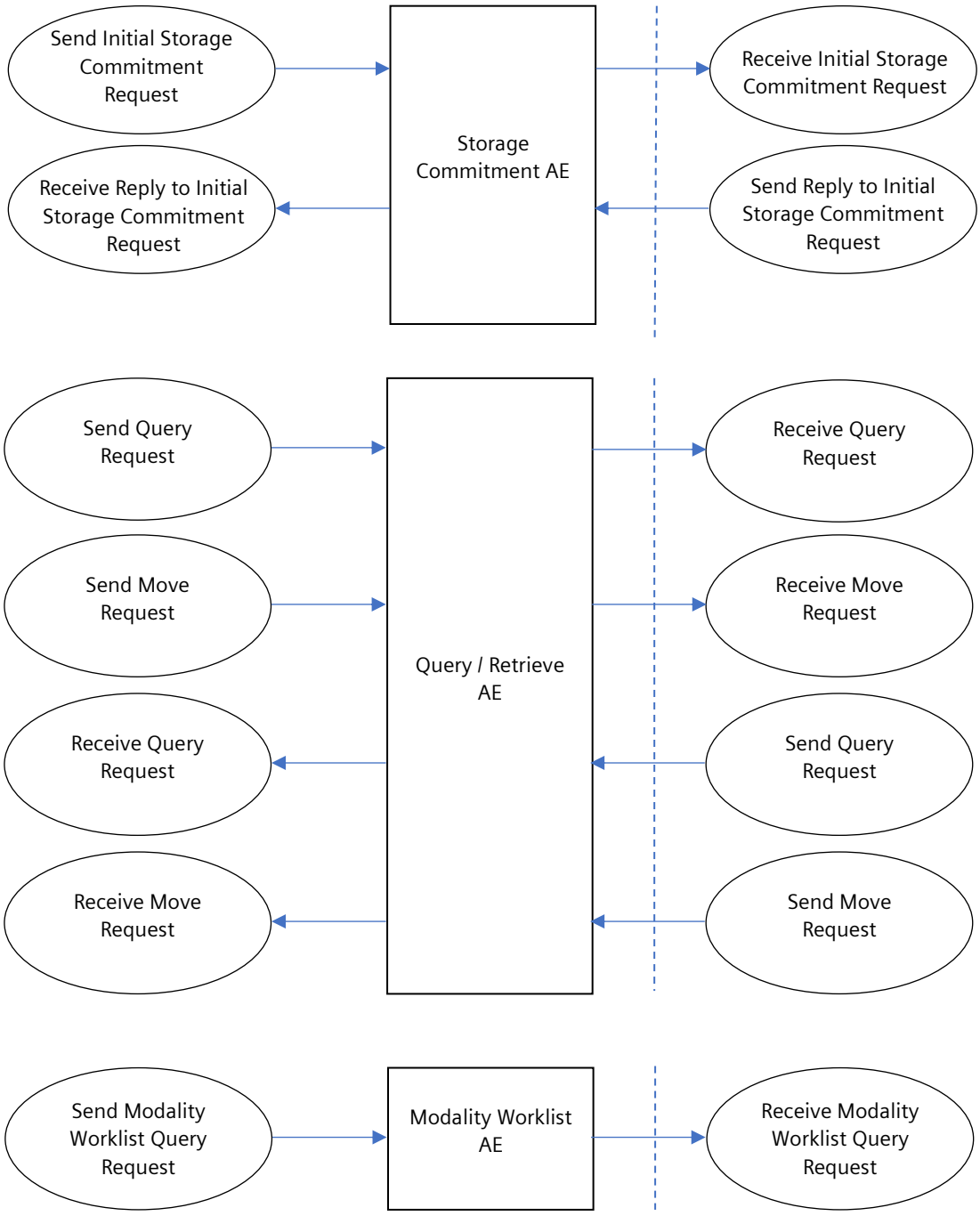
4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow

The following figure provides a functional overview of the syngo CT VB10A Application Entities (AE). Please do note that it is based on the default configuration and may differ depending on configuration at the customer site.




Send Initial Storage Commitment Request
Receive Reply to Initial Storage Commitment Request
Storage Commitment AE
Receive Initial Storage Commitment Request
Send Reply to Initial Storage Commitment Request
Send Query Request
Send Move Request
Receive Query Request
Receive Move Request
Query / Retrieve AE
Receive Query Request
Send Move Request
Send Modality Worklist Query Request
Modality Worklist AE
Receive Modality Worklist Query Request

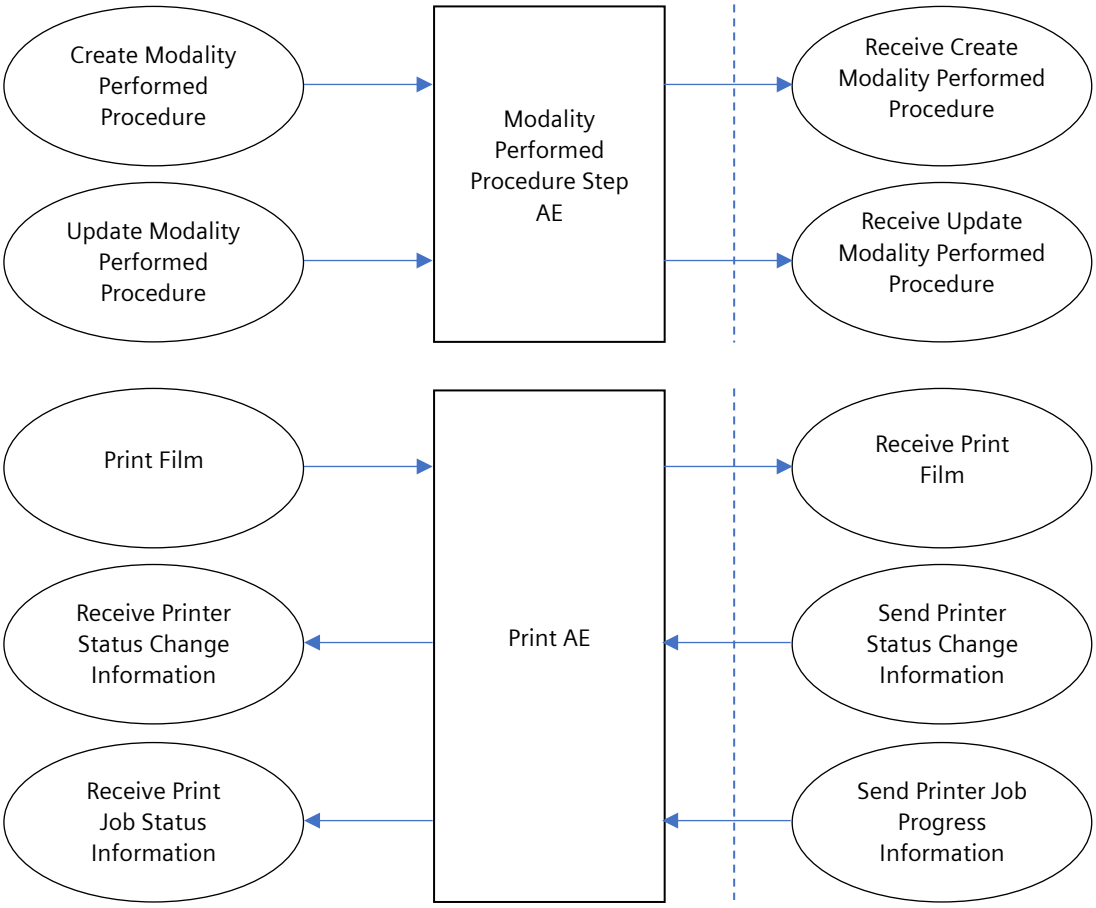

Create Modality Performed Procedure
Update Modality Performed Procedure
Modality Performed Procedure Step AE
Receive Create Modality Performed Procedure
Receive Update Modality Performed Procedure
Print Film
Receive Printer Status Change Information
Receive Print Job Status Information
Print AE
Receive Print Film
Send Printer Status Change Information
Send Printer Job Progress Information

Figure 1: syngo CT VB10A DICOM Data Flow diagram

4.1.2 Functional Definitions of AEs

The SCP components of the Application Entities of the syngo CT VB10A operate as background server processes. They exist as soon as the system is powered up and wait for association requests. Upon accepting an association with a negotiated Presentation Context they start to receive and process the requests described in the following sections.

The SCU components of the Application Entity are invoked upon requests from the user interface or indirect by trigger from internal processes.

4.1.2.1 Common Functional of all AE

The syngo CT VB10A supports the Verification Service as an SCP and SCU on all AEs. As an SCU, Verification can be activated from the Administrator Portal during system configuration by sending a C-ECHO-RQ.

As a SCP of the Verification Service the syngo CT VB10A processes and responds to incoming Verification requests using the C-ECHO-RSP.

4.1.2.2 Functional Definition of Storage AE

The syngo CT VB10A Storage SCU is invoked either directly by the user, by an auto-archive trigger or internally by the Query/Retrieve Application Entity that is responsible for processing retrieve requests. The job consists of data describing the composite objects selected for storage and the destination Application Entity Title. An association is negotiated with the destination Application Entity and the image data is transferred using the C-STORE-RQ. The transfer status is reported to the initiator of the Storage request.

The Storage SCP component of the syngo CT VB10A starts to receive the Composite Objects and import them into the database after accepting an association with a negotiated Presentation Context. The system responses to the Storage Request immediately after reception of the Data.

4.1.2.3 Functional Definition of the Storage Commitment AE

If configured, the syngo CT VB10A can serve as an SCU for the DICOM Storage Commitment Service. Upon successful completion of a Storage SCU job, the system uses the N-ACTION-RQ to request Storage Commitment from a remote DICOM Storage Commitment SCP. This can either be the same as the storage destination or a different system depending on the system configuration. Storage Commitment Requests are sent after a configurable delay (see 4.2.3.2.2.1)after storing the objects. The syngo CT VB10A can receive the N-EVENT-REPORT-RQ on the same or a different association.

4.1.2.4 Functional Definition of Query/Retrieve AE

The syngo CT VB10A supports DICOM Query/Retrieve as a SCU: The user can initiate a query to a remote node using the C-FIND-RQ. After matching the specified keys, the remote Query /Retrieve SCP uses the C-FIND-RSP to return the results of its search, which will be displayed to the user. Depending on user action the syngo CT VB10A Query/Retrieve DICOM SCU sends a C-MOVE-RQ to initiate a C-STORE sub-operation on the SCP to start an instance transfer from remote Storage SCU (running on Query/Retrieve SCP) to the system's Storage SCP.

The syngo CT VB10A supports the Models Study Root, Patient Root and Study/Patient Only (retired).

Furthermore, the SCU Services may issue relational queries, if supported by the remote Query/Retrieve SCP node and required by the querying Application.

The syngo CT VB10A DICOM Query/Retrieve SCP accepts C-FIND RQ, queries the local database based on the provided matching keys and returns the matches using the C-FIND-RSP. Depending on further request from the remote Query/Retrieve SCU, the syngo CT VB10A responds to C-MOVE-RQs by initiating a C-STORE sub-operation to send image objects to the Storage SCP of the querying system.

4.1.2.5 Functional Definition of Modality Worklist AE

The syngo CT VB10A Modality Worklist AE SCU issues DICOM Modality Worklist requests using C-FIND-RQs. The results in the C-FIND-RSPs are stored in internal database. The provided Patient and Procedure information is used for patient registration prior to starting an exam.

4.1.2.6 Functional Definition of Modality Performed Procedure Step SCU AE

The syngo CT VB10A MPPS SCU uses the N-CREATE-Request to inform an Information System that a procedure step is IN PROGRESS.

The syngo CT VB10A MPPS SCU uses the N-SET-Request to inform the Information System about the finalization of the Procedure Step, using either a status of COMPLETED or DISCONTINUED.

4.1.2.7 Functional Definition of Print AE

The Print SCU of the syngo CT VB10A is invoked by the user interface to setup film-sheet layout and whenever an image is ready to be printed on film. The Print SCU will hold and maintain all data needed to compile a complete film-sheet from the data (images, layout, configuration) received. Whenever a film-sheet is ready to print, the related data is used to supply the Information to the SOP Classes of the Print Management Service Class. A queue is maintained in order to intermediately store several film-sheets in case of resource problems on printer. The SCU will only supply and require the mandatory SOP Classes of the Print Management Service Class.

4.1.3 Sequencing of Real World Activities

This section describes the sequencing of the DICOM Communication Activities performed by the syngo CT VB10A Entities using a UML sequence diagram. The Entities are depicted as vertical bars. The arrows show the messages exchanged.

4.1.3.1 System Configuration

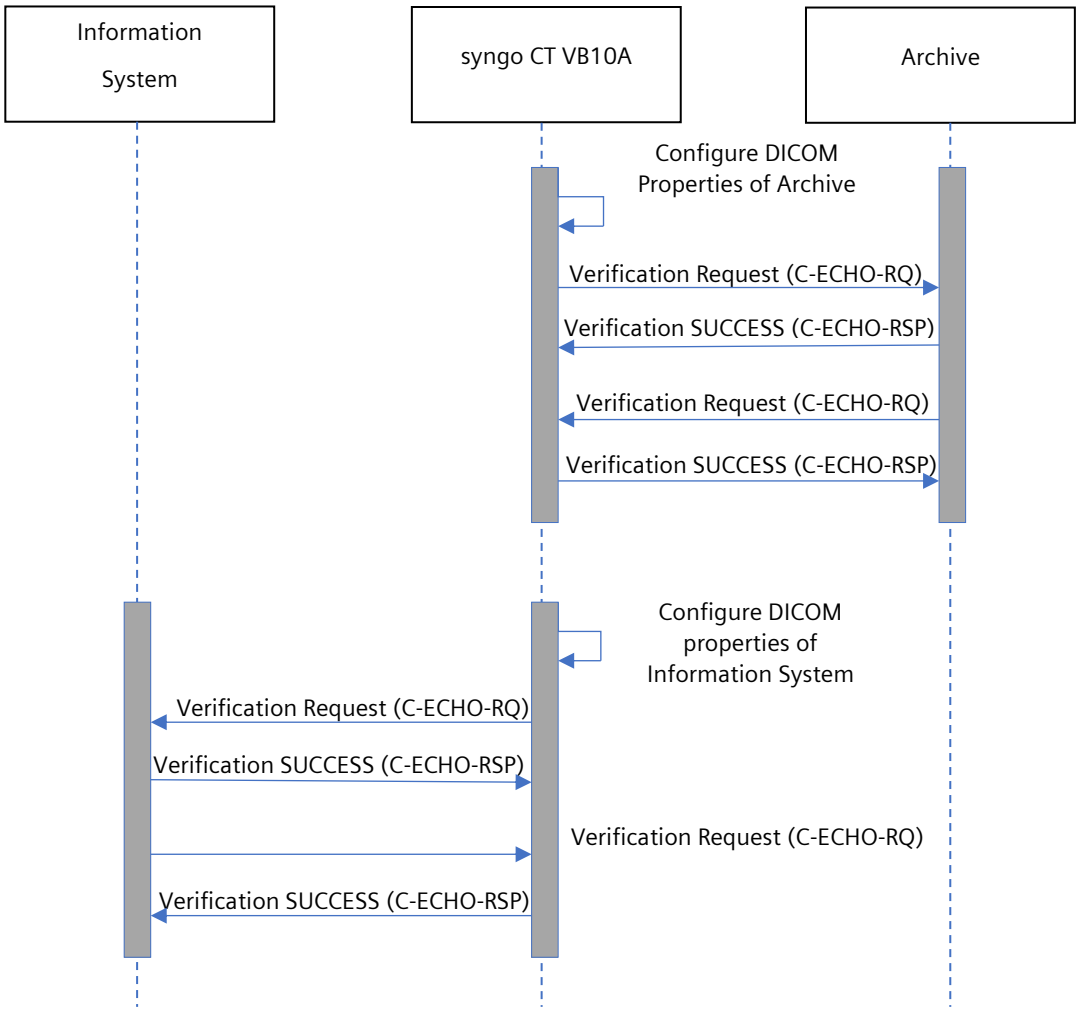


Figure 2: Sequence Diagram - System Configuration Workflow

4.1.3.2 Acquisition Workflow

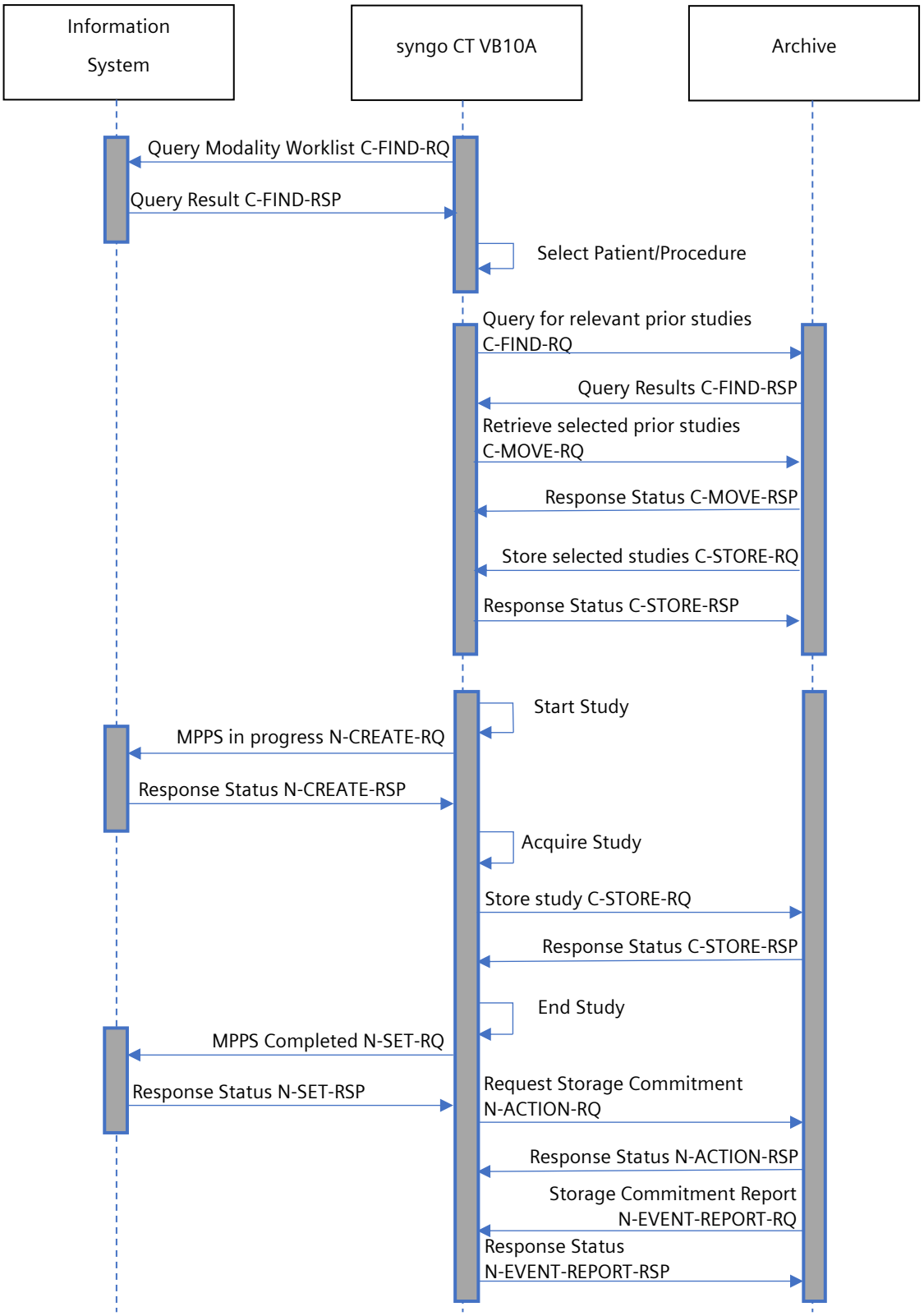


Figure 3: Sequence Diagram - Acquisition workflow

4.1.3.3 Printing Workflow

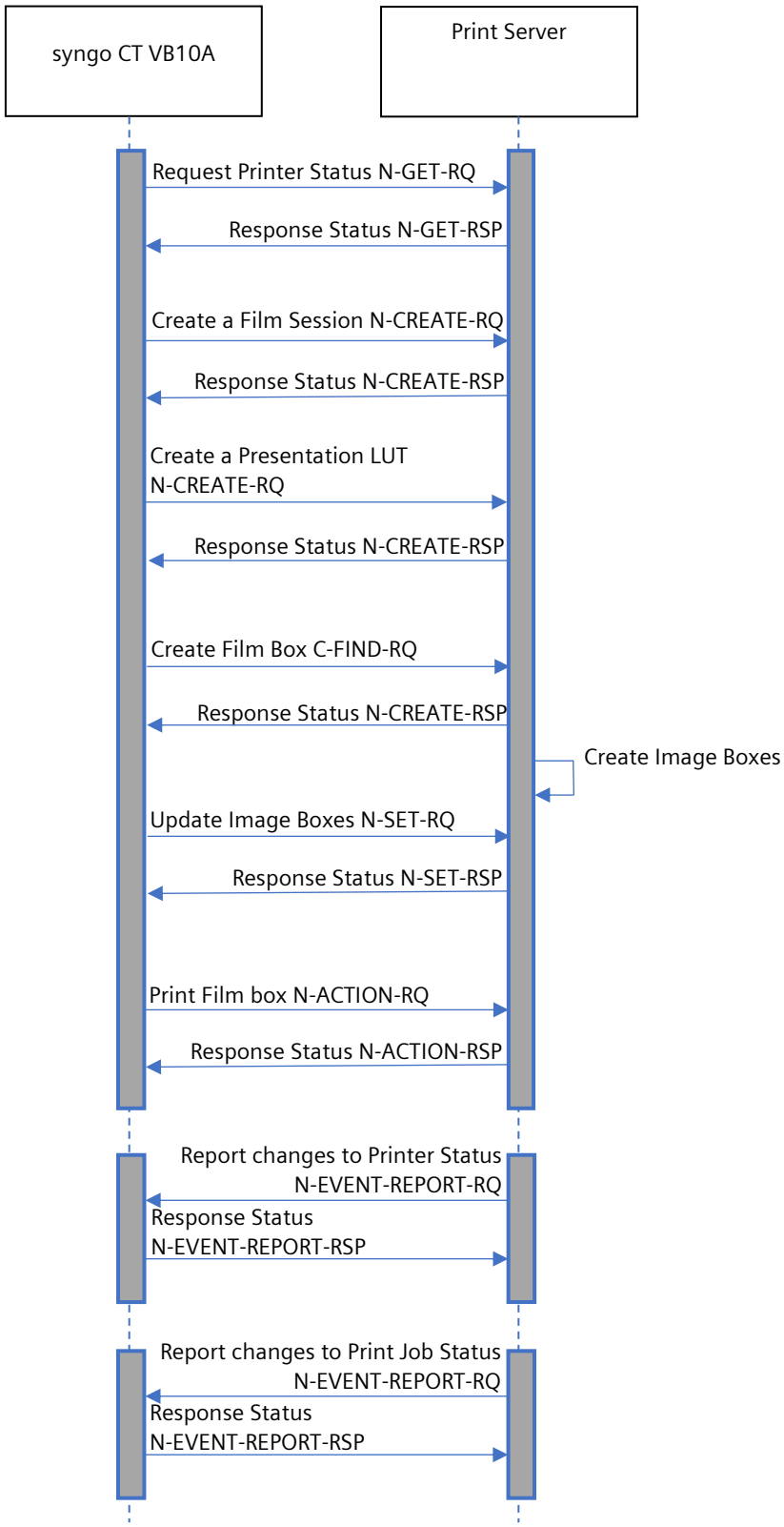


Figure 4: Printing

4.2 AE Specifications

This section outlines the specifications for each of the Application Entities that are part of the syngo CT VB10A.

4.2.1 Common AE Specifications

This section provides information that is common to all AEs described.

Since all AEs support the Verification SOP Class in their role (SCP, SCU or both), this document provides a single description for those in this section.

Furthermore, a brief description about the common aspects of the Association Acceptance Policies is presented.

4.2.1.1 SOP Classes

All AEs of syngo CT VB10A provide standard conformance to the Verification SOP Class.

4.2.1.2 Association Initiation Policy

Based on the security settings for the Local DICOM Node and the configured Remote DICOM Nodes, a secure or an unsecure communication channel will be initialized. The connection request will be sent using this channel.

4.2.1.2.1 Activity – "Send Verification Request"

All AE of the syngo CT VB10A Admin Portal attempt to open an Association for Verification Request whenever the Verification function is activated. Number of Associations

All AE of the syngo CT VB10A DICOM Service Tool application initiate a maximum number of associations at a time to request verification described in Table 5: Number of Association Policies.

Table 5: Number of Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

4.2.1.2.1.1 Asynchronous Nature

The syngo CT VB10A supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite.

Table 6: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.1.2.1.2 Implementation Identifying Information

For Implementation Identifying Information please refer to Table 3

4.2.1.2.1.3 Description and Sequencing of Activities

All AE serve as a SCU of the Verification Service Class. A C-ECHO-RQ is initiated whenever on the Administrator Portal "Verification" is requested. If an association to a remote Application Entity is successfully established, Verification with

[1] Default, the value is configurable.

the configured AET is requested via the open association. If the C-ECHO RSP from the remote Application contains a status other than “Success” this will be indicated to the user and the association is closed.

4.2.1.2.1.4 Proposed Presentation Contexts

Table 7: Proposed Presentation Contexts for all AE below lists the supported presentation contexts for verification requests.

Table 7: Proposed Presentation Contexts for all AE and Activity “Send Verification Request”

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.2.1.5 SOP specific Conformance for SOP classes

All AE provide standard conformance to the Verification Service Class.

During the Send Verification Request Activity a C-ECHO-RQ message is sent to a user selected Remote DICOM Node. A C-ECHO-RSP received always indicates a successful verification. The absence of the C-ECHO-RSP always indicates a failed verification.

If the response does not arrive in the time configurable as Inactivity Timeout (60 seconds by default), the Verification failed.

4.2.1.3 Association Acceptance Policy

4.2.1.3.1 Based on the calling AE Title

The user can configure if the syngo CT VB10A should accept Association Requests from any calling AE Title or only from those belonging to configured Remote Nodes, called known AE Titles.

If only calls from known AE Titles are accepted, the network connection is established, and the calling AE Title can send the A-ASSOCIATE-RQ. The syngo CT VB10A will reject Association Requests coming from unknown AE Titles (A-ASSOCIATE-RJ, Result: permanent, Source: 1, Reason/Diag.: 3 - calling-AE-title-not-recognized).

If calls from any AE Titles are accepted, Association Requests from all calling AE Titles will be accepted (A-ASSOCIATE-AC).

4.2.1.3.2 Based on the security settings for the Local and Remote DICOM Nodes

The user can impose via configuration secure and encrypted communication. This can affect only one Remote Node, which means, only the communication with the AE Title belonging to the respective Remote Node must be secure and encrypted.

If the Remote Node tries to open an unsecure and unencrypted network connection, the connection will be rejected. In this case no DICOM Messages are going to be exchanged.

The user can also impose via configuration that the syngo CT VB10A only accepts secure connections. In this case every unsecure and unencrypted connection attempt, will be rejected, before any DICOM Message can be sent.

In this case is the setting of accepting all calling AE Titles, due to technical reasons, ineffective. Only Association Requests from known Calling AE Titles will be accepted.

4.2.1.3.3 Activity – "Receive Verification Request"

4.2.1.3.3.1 Description and Sequencing of Activities

All AE of the syngo CT VB10A serve as an SCP of the Verification Service Class. If the AE as SCP accepts an association, it will respond to C-ECHO-RQs. If the Called AE Title does not match any pre-configured AE Title shared by SCP, the association will be rejected.

4.2.1.3.3.2 Accepted Presentation Contexts

The syngo CT VB10A DICOM application will accept Presentation Contexts as shown in the following table:

Table 8: Accepted Presentation Contexts Table for all AE and Activity "Receive Verification Request"

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.1.3.3.3 SOP specific Conformance – Verification SCP

All AE provide standard conformance to the Verification Service Class.

4.2.2 Storage AE Specification

4.2.2.1 SOP Classes

The Storage AE provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "Transfer" in the Conformance Statement Overview.

4.2.2.2 Association Policy

Table 9: Association Policy

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

The syngo CT VB10A contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

[1] Default, the value is configurable.

4.2.2.2.1 Asynchronous Nature

The syngo CT VB10A supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 10: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.2.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to Table 3: Implementation Identifying Information" in the Conformance Statement Overview

4.2.2.3 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.2.3.1 Activity "Send Verification Request"

The Storage AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

4.2.2.3.2 Activity "Send Instances"

4.2.2.3.2.1 Description and Sequencing of Activities

The Storage AE of syngo CT VB10A serves as a SCU of the Storage Service Class. The Storage SCU is triggered by the transfer job queue or by an external retrieve request. An association request is sent to the destination AE. Upon successful negotiation of a Presentation Context, the transfer is started. Objects will be transferred sequentially on the same open association.

4.2.2.3.2.2 Proposed Presentation Contexts

syngo CT VB10A proposes one Presentation Context for each SOP Class/Transfer Syntax combination in the A-ASSOCIATE-RQ. The number of Presentation Contexts in an A-ASSOCIATE-RQ message is limited to 128. If this limit is exceeded, multiple Transfer Syntaxes are offered in one presentation context.

For all Image Objects listed in Table 1 the Transfer Syntaxes marked with "yes" in the Image Objects Column of the table below are proposed in a Presentation Context.

For all Non-Image Objects listed in Table 1 in the Transfer Syntaxes marked with "yes" in the Non-Image Objects Column of the table below are proposed in a Presentation Context.

For a distinction between Image and Non-Image Objects please refer to the DICOM Standard PS3.3 Section A.1.4 "Overview of the Composite IOD Module Content [1]"

Table 11: Proposed Presentation Contexts for Storage

UID value	Transfer Syntax	Image Objects	Non-Image Objects
1.2.840.10008.1.2	Implicit VR Little Endian	Yes	Yes
1.2.840.10008.1.2.1	Explicit VR Little Endian	Yes	Yes
1.2.840.10008.1.2.2	Explicit VR Big Endian (Retired)	Yes	Yes
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1)	Yes	No
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4)	Yes	No
1.2.840.10008.1.2.4.57	JPEG Lossless, Non-Hierarchical (Process 14)	Yes	No

UID value	Transfer Syntax	Image Objects	Non-Image Objects
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14) [Selection Value 1])	Yes	No
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only)	Yes	No
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression	Yes	No
1.2.840.10008.1.2.5	RLE Lossless	Yes	No

Depending on the configuration, the Storage SCU will choose a compressed or uncompressed Transfer Syntax among those accepted by the SCP. The Transfer Syntax chosen is the preferred one among the compressed and uncompressed ones. The preference order is the order of occurrence in the configuration. For each node it is possible to select Transfer Syntaxes, that can be used, and Transfer Syntaxes, that are excluded. The configuration can even be extended, based on the combination of SOP Classes and supported Transfer Syntaxes. If the SCP does not accept any Transfer Syntax offered by the SCU, the transfer will fail (Negotiation Error).

An instance will be JPEG lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2, RGB, YBR_FULL
- Bits Allocated (0028,0100) equal to ‘16 or ‘8’
- Bits Stored (0028,0101) equal to ‘12’ or ‘8’
- High Bit (0028,0102) equal to Bits Stored (0028,0101) – 1
- Pixel Representation (0028,0103) equal to ‘0’

An instance will be JPEG lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2 or RGB
- Bits Allocated (0028,0100) equal to ‘16’ or ‘8’
- Bits Stored (0028,0101) equal to ‘12’ or ‘8’
- High Bit (0028,0102) equal to Bits Stored (0028,0101) – 1
- Pixel Representation (0028,0103) equal to ‘0’
- Only lossy transfer syntaxes are supported (Implicit Little Endian is not supported) at the remote side

An instance will be JPEG 2000 lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME, RGB, YBR_FULL or YBR_FULL_422
- Bits Allocated (0028,0100) equal to ‘16’ or ‘8’

An instance will be RLE lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is MONOCHROME, YBR_FULL or RGB

Bits Allocated (0028,0100) ‘8’ or ‘16’ for MONOCHROME, ‘24’ for other interpretations. An instance will be JPEG 2000 lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is MONOCHROME, YBR_FULL or RGB
- Bits Stored (0028,0101) equal to ‘12’ or ‘8’
- Only lossy transfer syntaxes are supported (Implicit Little Endian is not supported) at the remote side

There is no extended negotiation as an SCU.

4.2.2.3.2.3 SOP Specific Conformance for SOP Classes

The syngo CT VB10A does not add or change private attributes by default, even in case objects are compressed or the image header is updated according to IHE [2] Patient Information Reconciliation Profile.

The behavior of syngo CT VB10A when encountering status codes for all SOP classes listed in Table 1in a C-STORE-RSP is summarized in Table 12

Table 12: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Error	Any other DIMSE Error Status	Any none 0000 Code	Send is continued till the end. Log message is created.
Success	Image is successfully stored	0000	If configured, Storage Commitment is requested for successfully stored instances

Table 13 below indicates the behavior if exceptions occur:

Table 13: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Log message is created (Timeout configurable; default 30s)
Association Aborted	Send is failed. Log message is created.

4.2.2.3.2.4 Correction and Rearrangement

When a Study is moved to a different ...

- Procedure received through a DICOM Modality Worklist, the Study Instance UID is overwritten with the Study Instance UID and Accession Number of the Procedure.
- Patient, the system generates a new Study Instance UID.

The system will not update references to the changed Study Instance UIDs therefore it is possible that there will be broken links between Studies after such move operations.

In case of Patient Merge and Correction no UIDs are changed, therefore it is advised to delete any corrected or rearranged objects from the PACS before attempting to archive them again, to ensure that the PACS system can store them successfully.

When the Patient Position (0018,5100) attribute is corrected, the following attributes are recalculated by the system (no UIDs are changed):

1. Image Position (0020,0032)
2. Image Orientation (0020,0037)
3. Patient Orientation (0020,0020)
4. Data Collection Center (Patient) (0018,9313) (CT only)
5. Reconstruction Target Center (Patient) (0018,9318) (CT only)
6. Positioner Primary Angle (0018,1510) (XA only)
7. Positioner Secondary Angle (0018,1511) (XA only)

Also, the value of the Slice Location (0020,1041) attribute is emptied, and a new Frame of Reference UID (0020,0052) is generated for the corrected series.

When the Patient's Birth Date (0010,0030) or the Study Date (0008,0020) is corrected, the system recalculates the Patient's Age (0010,1010).

A new item containing attributes that were removed or replaced by other values is added to the Original Attribute Sequence (0400,0561).

4.2.2.4 Association Acceptance Policy

For general information regarding the association acceptance policies please see Chapter 4.2.1.3.

4.2.2.4.1 Activity – "Receive Verification Request"

The Storage AE supports the Verification SOP Class. For further details please see chapter 4.2.1.3.3.

4.2.2.4.2 Activity – "Receive Instances"

4.2.2.4.2.1 Description and Sequencing of Activities

The Storage AE of syngo CT VB10A serves as an SCP of the Storage Service Class. The storage SCP accepts incoming C-STORE-RQ from any configured AE Title, receives supported objects transmitted on that association and stores them in the local database.

4.2.2.4.2.2 Accepted Presentation Contexts

When receiving an association request from a remote node, syngo CT VB10A accepts all presentation context containing a transfer syntax configured for that node. If multiple transfer syntaxes are proposed within one presentation context, syngo CT VB10A selects it based on the configured preference order configured for that node. The preference order is the order of occurrence of the transfer syntaxes in the configuration. For each node it is possible to select Transfer Syntaxes, that can be used, and Transfer Syntaxes, that are excluded. The configuration can even be extended, based on the combination of SOP Classes and supported Transfer Syntaxes.

Table 11 lists all Transfer Syntaxes that are supported for the Transfer Objects (see "Table 1: Network Services" section "SOP Classes Created by the syngo CT VB10A" and "SOP Classes Managed by the syngo CT VB10A" in the Conformance Statement Overview.) the Transfer Syntaxes are described in Table 11.

There is no Extended Negotiation as an SCP.

4.2.2.4.2.3 SOP-specific Conformance for Storage SOP classes

The syngo CT VB10A conforms to the Storage Level 2 (Full).

In case of a successful C-STORE operation, the image has successfully been received in the negotiated transfer syntax.

The Storage AE of the syngo CT VB10A returns the status "success" when the data is received, and a minimal image header validation has been performed.

The following header attributes must be available, filled and are valid:

- SOP Class UID,
- Study Instance UID,
- Series Instance UID and
- SOP Instance UID.

Table 14 below list the status codes that the syngo CT VB10A can return:

Table 14: Storage C-STORE-RSP Status

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	Image received correctly (success notification is done after receiving, before indexing and storing)
Failure	Out-of-resource	A700	No resource left in the Short Term Storage

Service Status	Further Meaning	Error Code	Reason
Failure	Unable to Process	C000	CStoreFailureCannotUnderstand – The received data is not valid and cannot be stored
		C002	CStoreFailedOperation – The received data could not be stored due to the Study content
Failure	Data set does not match SOP Class	A900	CStoreFailureInvalidDataSet – Data Set does not match SOP Class and thus cannot be stored.

4.2.2.4.2.3.1 Other SOP specific behavior

If an image is received that is already stored in the database – identified by the SOP Instance UID – the new image will be ignored. The existing instance is not superseded.

4.2.3 Storage Commitment AE Specification

4.2.3.1 SOP Classes

The Storage Commitment AE of the syngo CT VB10A provides standard conformance to the SOP Class listed in "Table 1: Network Services" section "Workflow Management" Association Policy.

Table 15: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

The Storage Commitment AE contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.3.1.1 Asynchronous Nature

The Storage Commitment AE supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite.

Table 16: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.3.1.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3: Implementation Identifying Information" in the Conformance Statement Overview.

[1] Default, the value is configurable.

4.2.3.2 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.3.2.1 Activity "Send Verification Request"

The Storage Commitment AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

4.2.3.2.2 Activity "Send Initial Storage Commitment Request"

4.2.3.2.2.1 Description and Sequencing of Activities

The Storage Commitment AE serves as an SCU of the Storage Commitment Service Class. After successful archive (C-STORE) of Imaging Objects to a configured Archive, the Storage Commitment SCU initiates an N-ACTION-RQ, if Storage Commitment is configured. Storage Commitment is supported for all Storage SOP Classes listed in Table 1: Network Service sections SOP Classes created/managed by syngo CT VB10A. This request will be sent on a different association than the storage request.

The Storage Commitment Request will be sent out with a delay, to ensure that the remote node properly indexes received instances. The delay time is configurable with a default delay of 10 minutes.

The system may issue one N-ACTION-RQ for a complete set (bundle) of instances, or issue one N-ACTION-RQ per instance. This behavior is configurable; the default value is "bundled".

The syngo CT VB10A does not support the Storage Media File-Set ID and UID attributes.

The syngo CT VB10A will accept the N-EVENT-REPORT-RQ on the same association if sent immediately after the N-ACTION-RSP. However, it will not wait for it. The association is closed after three seconds.

4.2.3.2.2.2 Proposed Presentation Contexts

The Storage Commitment AE supports the Presentation Contexts listed in the following table for the Storage Commitment Service Class.

Table 17: Proposed Presentation Contexts for Storage Commitment

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.3.2.2.3 SOP specific Conformance for SOP classes

The behavior of Storage Commitment AE when encountering status codes for all SOP classes listed in Table 1 in an N-ACTION-RSP is summarized in Table 18:

Table 18: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Any failure that occurs	Any none 0000 Code	Failure reported to user; corresponding object(s) will be marked as "Archived failed"
Success	All Instances are available on the remote node	0000	Success reported to user; in case failures exist, the corresponding instances

Service Status	Further Meaning	Error Code	Behavior
			will be marked as “Archived failed”

Table 19 below indicates the behavior if exceptions occur:

Table 19: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Failure reported to user (Timeout configurable; default 30s); the request will be retried
Association Aborted	Failure reported to user; the request will be retried

4.2.3.3 Association Acceptance Policy

For general information regarding the association acceptance policies please see Chapter 4.2.1.3.

4.2.3.3.1 Activity – “Receive Verification Request”

The Storage Commitment AE supports the Verification SOP Class. For further details please see chapter 4.2.1.3.3.

4.2.3.3.2 Activity “Receive Reply to Initial Storage Commitment Request”

4.2.3.3.2.1 Description and Sequencing of Activities

The Storage Commitment AE of the syngo CT VB10A supports the reverse role negotiation of the Storage Commitment Service Class as the SCU. It accepts incoming N-EVENT-REPORT-Request if they do not arrive on the same association as the N-ACTION-RQ.

The syngo CT VB10A has a configurable expiration timeout for the TransactionUID. By default, the TransactionUID is 60 minutes.

4.2.3.3.2.2 Accepted Presentation Contexts

The Storage Commitment AE supports the presentation contexts listed in the following table for the Storage Commitment Service Class.

Table 20: Presentation Context Table "Storage Commitment"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.3.3.2.3 SOP-specific Conformance for Storage Commitment SOP class

The Storage Commitment AE provides standard conformance to the Storage Commitment SOP Class.

4.2.3.3.2.3.1 Storage Commitment Failure Conditions

Table 21 lists conditions upon which an error code is sent in the Failure Reason (0008,1197) Attribute in the Failed SOP Sequence (0008,1198) of the N-EVEN-REPORT-RQ.

Table 21: Storage Commitment Failure Behavior

Status Code	Description	Behavior
0110	Processing failure: A general failure in processing the operation was encountered.	Following processing is in place: 1. Logging All the incoming Status Codes are logged. 2. Tracing All the incoming Status Codes can be traced. 3. Providing the Status Codes to the user of the module The activity provides for the users an API to get all the Status Codes
0122	No such object instance: One or more of the elements in the Referenced SOP Instance Sequence was not available.	
0119	Class / Instance conflict: The SOP Class of an element in the Referenced SOP Instance Sequence did not correspond to the SOP Class registered for this SOP Instance at the SCP.	
0122	Referenced SOP Class not supported: Storage Commitment has been requested for a SOP Instance with a SOP Class that is not supported by the SCP	
0131	Duplicate transaction UID: The Transaction UID of the Storage Commitment Request is already in use.	
0213	Resource limitation: The SCP does not currently have enough resources to store the requested SOP Instance(s).	

4.2.4 Query/Retrieve AE Specification

4.2.4.1 SOP Classes

The Query/Retrieve AE provides Standard Conformance to the SOP Classes listed in “Table 1: Network Services” section "Query/Retrieve”.

4.2.4.2 Association Policy

Table 22: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

The Query/Retrieve AE a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

[1] Default, the value is configurable.

4.2.4.2.1 Asynchronous Nature

The syngo CT VB10A supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 23: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.4.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to Table 3.

4.2.4.3 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.4.3.1 Activity "Send Verification Request"

The Query/Retrieve AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

4.2.4.3.2 Activity "Send Query Request" for Instances

4.2.4.3.2.1 Description and Sequencing of Activities

The Query/Retrieve AE serves as an SCU for the Study Root Q/R Information Model – FIND SOP Class

Using the attributes specified by the user as Query Keys (in accordance with the query model) the Query SCU initiates a C-FIND-RQ and displays the responses to the user.

The User can cancel on the User Interface a running Query. After sending the Cancel Request the Association will be closed.

4.2.4.3.2.2 Proposed Presentation Contexts

The Query/Retrieve AE will propose Presentation Contexts as shown in the following table:

Table 24: Proposed Presentation Contexts for Query

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Study Root Query/ Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Table 25: Extended Negotiation as an SCU

Name	UID	Extended Negotiation
Study Root Query/ Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Relational Query will be negotiated as defined in DICOM PS3.4

4.2.4.3.2.3 SOP Specific Conformance Statement to Query SOP classes

The Query/Retrieve AE checks for the following status codes in the Query SCP's C-FIND-RSP:

Table 26: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	e.g. Out of Resources; Identifier does not match SOP Class; Unable to process	Any none 0000, FF00, FE00 and FF01 Code	Failure reported to user
Cancel	The user has cancelled the Query and the Remote Node confirms the cancellation. If no confirmation arrives, the Association will be closed.	FE00	The processing of the incoming data on the respective Association is stopped and the cancellation is logged.
Pending	All optional keys are supported the same manner as Required Keys.	FF00	Pending state is indicated to user
	Matching Operation continues; some of the optional keys were not supported the same way as the required keys	FF01	Pending state is indicated to user
Success	Query has been performed successfully.	0000	Success reported to user

Table 27 below indicates the behavior if exceptions occur:

Table 27: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

The syngo CT VB10A supports the following query levels:

- Study
- Series

Matching Keys on Instance Level is not supported by the Query/Retrieve AE as SCU.

The following table lists the various attributes at Study and Series level, which can be used for hierarchical queries as well as return values for display. The display capabilities are highly configurable and "yes" indicates that it is possible to configure display of the data:

Table 28: Attributes supported for Study/Series Query - SCU

Attribute Name	Tag	Type	User input	UI
Study Level				
Patient's Name	(0010,0010)	O	enter value	Yes
Patient ID	(0010,0020)	O	enter value	Yes
Issuer of Patient ID	(0010,0021)	O	enter value	Yes
Patient's Birth Date	(0010,0030)	O	enter value	Yes
Patient's Birth Time	(0010,0032)	O	enter value	Yes
Patient's Sex	(0010,0040)	O	enter value	Yes
Accession Number	(0008,0050)	O	enter value	Yes
Study ID	(0020,0010)	O	enter value	Yes
Study Instance UID	(0020,000D)	U	enter value	Yes

Attribute Name	Tag	Type	User input	UI
Study Date	(0008,0020)	O	enter value	Yes
Study Time	(0008,0030)	O	enter value	Yes
Referring Physician's Name	(0008,0090)	O	enter value	Yes
Study Description	(0008,1030)	O	enter value	Yes
Number of Study Related Instances	(0020,1208)	O	-	Yes
Modalities in Study	(0008,0061)	O	enter value	Yes
Number of Study Related Series	(0020,1206)	O	-	Yes
Series Level				
Modality	(0008,0060)	O	enter value	Yes
Series Date	(0008,0021)	O	enter value	Yes
Series Time	(0008,0031)	O	enter value	Yes
Number of Series Related Instances	(0020,1209)	O	-	Yes
Series Number	(0020,0011)	O	enter value	Yes
Series Description	(0008,103E)	O	enter value	Yes
Request Attributes Sequence \ Requested Procedure ID	(0040,0275).(0040,1001)	O	enter value	Yes
Request Attributes Sequence \ Scheduled Procedure Step ID	(0040,0275).(0040,0009)	O	enter value	Yes
Performed Procedure Step Start Date	(0040,0244)	O	enter value	Yes
Performed Procedure Step Start Time	(0040,0245)	O	enter value	Yes
Series Instance UID	(0020,000E)	U	-	Yes

Legend:

- U – Unique Key Attribute
- R – Required Key Attribute
- O – Optional Key Attribute

4.2.4.3.3 **Activity "Send Move Request"**

4.2.4.3.3.1 Description and Sequencing of Activities

The Query/Retrieve AE serves as an SCU for the Study Root Q/R Information Model – MOVE SOP Class.

The C-MOVE-RQ is used to retrieve the selected imaging objects. The Query/Retrieve AE supports the query model Study Root as SCU.

4.2.4.3.3.2 Proposed Presentation Contexts

The Query/Retrieve AE proposes Presentation Contexts shown in the following table:

Table 29: Proposed Presentation Contexts for Retrieve and Activity "Send Move Request"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg
Name	UID	Name List	UID List		
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.4.3.3.3 SOP Specific Conformance Statement for Move SCU SOP Class

The behavior of Query/Retrieve AE when encountering status codes for all SOP classes listed in Table 1 in a C-MOVE-RSP is summarized in Table 30

Table 30: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process; Move destination unknown	Any none 0000 and FF00 Code	Failure reported to user
Pending	Move Operation continues	FF00	Operation continues in background
Success	Move has been performed successfully.	0000	Success reported to user

Table 31 below indicates the behavior if exceptions occur:

Table 31: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.4.4 Association Acceptance Policy

For general information regarding the association acceptance policies please see Chapter 4.2.1.3.

4.2.4.4.1 Activity – "Receive Verification Request"

The Query/Retrieve AE supports the Verification SOP Class. For further details please see chapter 4.2.1.3.3.

Latency

The Query/Retrieve AE handles the Query/Retrieve equally using the *first came first served* principle. Latency can occur if the hardware capacity is not sufficient for serving all incoming requests immediately. Both factors, that can lead to latency (hardware capacity and number of incoming request) must be managed by the user of the syngo CT VB10A.

The Query/Retrieve AE does not support Storage Media File-Set ID and UID attributes in the N-ACTION message.

4.2.4.4.2 Activity "Receive Query Request"

4.2.4.4.2.1 Description and Sequencing of Activities

The Query/Retrieve AE serves as an SCP for

- Patient Root Q/R Information Model – FIND SOP Class
- Study Root Q/R Information Model – FIND SOP Class
- Patient/Study Only Q/R Information Model – FIND SOL Class (retired)

Using the attributes specified by the user as Query Keys (in accordance with the query model) the Query SCP accepts a C-FIND-RQ and provides the responses for the requesting Remote AE.

The Remote Node can request the cancellation of a running Query.

4.2.4.4.2.2 Accepted Presentation Contexts

The Query/Retrieve AE supports the presentation contexts listed in the following table for the Query/Retrieve Service Class:

Table 32: Acceptable Presentation Contexts for "Receive Query Request"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Study Root Query/ Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Table 33: Extended Negotiation as an SCP

Name	UID	Extended Negotiation
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Relational Query will be negotiated as defined in DICOM PS3.4
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	

4.2.4.4.2.3 SOP-specific Conformance for Query/Retrieve SOP classes

The Query/Retrieve AE provides one of the following status codes in the C-FIND-RSP:

Table 34: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code
Failure	e.g. Out of Resources; Identifier does not match SOP Class; Unable to process	Any none 0000, FF00 and FF01 Code
Cancel	The Remote Node has sent a C-CANCEL-RQ. The processing of the Query is stopped and a C-FIND-RSP is sent with the Status Cancelled as confirmation.	FFE0
Pending	All optional keys are supported the same manner as Required Keys.	FF00
	Matching Operation continues; some of the optional keys were not supported the same way as the required keys	FF01
Success	Query has been performed successfully.	0000

The syngo CT VB10A supports the following query levels:

Study
Series
Image

The following table lists the various attributes at Study, Series and Image level, which can be used for hierarchical queries as well as return values for display.

Table 35: Attributes supported for Study/Series Query – SCP

Attribute Name	Tag	Type
Study Level		
Patient's Name	(0010,0010)	O
Patient ID	(0010,0020)	O
Issuer of Patient ID	(0010,0021)	O
Patient's Birth Date	(0010,0030)	O
Patient's Birth Time	(0010,0032)	O
Patient's Sex	(0010,0040)	O
Accession Number	(0008,0050)	O
Study ID	(0020,0010)	O
Study Instance UID	(0020,000D)	U
Study Date	(0008,0020)	O
Study Time	(0008,0030)	O
Referring Physician's Name	(0008,0090)	O
Study Description	(0008,1030)	O
Number of Study related Instances	(0020,1208)	O
Modalities in Study	(0008,0061)	O
Number of Study Related Series	(0020,1206)	O

Attribute Name	Tag	Type
Series Level		
Modality	(0008,0060)	O
Series Date	(0008,0021)	O
Series Time	(0008,0031)	O
Number of Series Related Instances	(0020,1209)	O
Series Number	(0020,0011)	O
Series Description	(0008,103E)	O
Request Attributes Sequence \ Requested Procedure ID	(0040,0275).(0040,1001)	O
Request Attributes Sequence \ Scheduled Procedure Step ID	(0040,0275).(0040,0009)	O
Performed Procedure Step Start Date	(0040,0244)	O
Performed Procedure Step Start Time	(0040,0245)	O
Series Instance UID	(0020,000E)	U
Image Level		
Instance Number	(0020,0013)	R
SOP Instance UID	(0008,0018)	U
SOP Class UID	(0008,0016)	O

4.2.4.4.3 Activity "Receive Move Request"

4.2.4.4.3.1 Description and Sequencing of Activities

The Query/Retrieve AE of the syngo CT VB10A serves as an SCP for Study Root Q/R Information Model – MOVE SOP Class, Patient Root Q/R Information Model – MOVE SOP Class and for Study/Patient Only Q/R Information Model – Move SOP Class.

The C-MOVE-RQ is used to retrieve the selected imaging objects.

4.2.4.4.3.2 Accepted Presentation Contexts

The Query/Retrieve AE accepts Presentation Contexts shown in the following table:

Table 36: Accepted Presentation Contexts for Retrieve and Activity "MOVE SCP"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.4.4.3.3 SOP-specific Conformance for MOVE SOP classes

The behavior of Query/Retrieve AE when encountering status codes for all SOP classes listed in Table 1 in a C-MOVE-RSP is summarized in Table 37

Table 37: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Reason
Error	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process; Move destination unknown	Any none 0000 Code	Failure reported to user
Pending	Move Operation continues	FF00	Operation continues in background
Success	Move has been performed successfully.	0000	Success reported to user

4.2.5 Modality Worklist AE Specification

4.2.5.1 SOP Classes

The Modality Worklist AE provides Standard Conformance to the SOP Classes listed in “Table 1: Network Services" , section “Worklist Management (Modality Worklist Information Model – FIND)” in the Conformance Statement Overview.

4.2.5.2 Association Policy

Table 38: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

The syngo CT VB10A contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.5.2.1 Asynchronous Nature

The Modality Worklist AE supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 39: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.5.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to Table 3.

4.2.5.3 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.5.3.1 Activity “Send Verification Request”

The Modality Worklist AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

[1] Default, the value is configurable

4.2.5.3.2 Activity "Send Modality Worklist Query Request"

4.2.5.3.2.1 Description and Sequencing of Activities

The syngo CT VB10A serves as a SCU of the Modality Worklist AE service. It performs worklist queries by issuing a C-FIND request at regular configurable intervals. In addition a worklist request can be triggered manually.

4.2.5.3.2.2 Proposed Presentation Contexts

The Modality Worklist AE will propose Presentation Contexts as shown in the following table:

Table 40: Proposed Presentation Contexts for Worklist

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist-FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.5.3.2.3 SOP Specific Conformance for SOP Classes

Search Key Attributes of the Worklist C-FIND

The Modality Worklist AE supports "broad worklist queries" with all required search keys. The following tables describe the "broad query" search keys that the SCU supports. The list is configurable in 'DICOM Modality Worklist Query'.

Table 41: Broad Query search keys

Attribute Name	Tag	Matching Key Type	Query Value
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	R	
>Modality	(0008,0060)	R	<configured by Modality> or "*"
>Scheduled Station AE Title	(0040,0001)	R	<own AET> or "*"[3]
>Scheduled Procedure Step Start Date	(0040,0002)	R	Range from UI [4]
>Scheduled Station Name	(0040,0010)	O	
>Scheduled Procedure Step Location	(0040,0011)	O	
>Scheduled Procedure Step Status	(0040,0020)	O	
>Scheduled Performing Physician's Name	(0040,0006)	O	
Requested Procedure Description	(0032,1060)	O	
Requested Procedure Priority	(0040,1003)	O	
Patient Transport Arrangements	(0040,1004)	O	
Requested Procedure Comments	(0040,1400)	O	
Requested Procedure Code Sequence	(0032,1064)	O	
>Code Value	(0008,0100)	O	
Requesting Physician	(0032,1032)	O	
Referring Physician's Name	(0008,0090)	O	
Current Patient Location	(0038,0300)	O	
Pregnancy Status	(0010, 21C0)	O	
Medical Alerts	(0010,2000)	O	

[3] This depends on user configuration (Administration Portal->Technical Configuration->DICOM Nodes->Local DICOM Node->Worklist) if the "own AET" is provided or not.

[4] A time window can be configured by defining how many days to look into the past and into the future (Administration Portal-> Technical Configuration->DICOM Nodes->Local DICOM Node->Worklist)

Attribute Name	Tag	Matching Key Type	Query Value
Allergies	(0010,2110)	O	

Legend:

- U – Unique Key Attribute
- R – Required Key Attribute
- O – Optional Key Attribute

Return Key Attributes of the Modality Worklist C-FIND

The Modality Worklist AE SCU supports worklist queries with return key attributes of all types. The following tables describe the return keys that the SCU supports.

An "yes" in the UI column indicates that the attribute may be visualized when browsing the Worklist results with the Browser. The Browser display is additionally influenced by the related Browser configuration.

Table 42: Modality Worklist C-Find Return keys

Attribute Name	Tag	Return Key Type	UI	Notes
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)	1	No	
>Modality	(0008,0060)	1	Yes	
>Scheduled Station AE Title	(0040,0001)	1		"Scheduled Station AE Title" is taken as default for "Performed Station AE Title"
>Scheduled Procedure Step Start Date	(0040,0002)	1	Yes	
>Scheduled Procedure Step Start Time	(0040,0003)	1	Yes	
>Scheduled Procedure Step End Date	(0040,0004)	3	No	
>Scheduled Procedure Step End Time	(0040,0005)	3	No	
>Scheduled Performing Physician's Name	(0040,0006)	1	Yes	"Scheduled Performing Physician's Name" is taken as default for "Performing Physician's Name"
>Scheduled Procedure Step Description	(0040,0007)	1C	Yes	"Scheduled Procedure Step Description" is taken as default for "Performed Procedure Step Description"
>Scheduled Protocol Code Sequence	(0040,0008)	1C	No	"Scheduled Protocol Code Sequence" is taken as default for "Performed Protocol Code Sequence"
>>Code Value	(0008,0100)	1C	No	
>>Coding Scheme Designator	(0008,0102)	1C	No	
>>Coding Scheme Version	(0008,0103)	3	No	
>>Code Meaning	(0008,0104)	3	No	
>>Mapping Resource	(0008,0105)	3	No	
>>Context Group Version	(0008,0106)	3	No	
>>Context Group Local Version	(0008,0107)	3	No	

Attribute Name	Tag	Return Key Type	UI	Notes
>>Context Group Extension Flag	(0008,010B)	3	No	
>>Context Group Extension Creator UID	(0008,010D)	3	No	
>>Context Identifier	(0008,010F)	3	No	
>Scheduled Procedure Step ID	(0040,0009)	1	Yes	"Scheduled Procedure Step ID" is taken as default for "Performed Procedure Step ID"
>Scheduled Station Name	(0040,0010)	2	Yes	
>Scheduled Procedure Step Location	(0040,0011)	2	No	"Scheduled Procedure Step Location" is taken as default for "Performed Location"
>Scheduled Procedure Step Status	(0040,0020)	3	No	
>Comments on the Scheduled Procedure Step	(0040,0400)	3	No	
Requested Procedure				
Study Date	(0008,0020)	3	No	
Study Time	(0008,0030)	3	No	
Referenced Study Sequence	(0008,1110)	2	No	
>Referenced SOP Class UID	(0008,1150)	1C	No	
>Referenced SOP Instance UID	(0008,1155)	1C	No	
Study Instance UID	(0020,000D)	1	No	
Requested Procedure Description	(0032,1060)	1C	Yes	
Requested Procedure Code Sequence	(0032,1064)	1C	No	"Requested Procedure Code Sequence" is taken as default for "Procedure Code Sequence"
>Code Value	(0008,0100)	1C	No	
>Coding Scheme Designator	(0008,0102)	1C	No	
>Coding Scheme Version	(0008,0103)	3	No	
>Code Meaning	(0008,0104)	3	No	
>Mapping Resource	(0008,0105)	3	No	
>Context Group Version	(0008,0106)	3	No	
>Context Group Local Version	(0008,0107)	3	No	
>Context Group Extension Flag	(0008,010B)	3	No	
>Context Group Extension Creator UID	(0008,010D)	3	No	
>Context Identifier	(0008,010F)	3	No	
Requested Procedure ID	(0040,1001)	1	Yes	"Requested Procedure ID" is taken as default for "Study ID"
Reason for the Requested Procedure	(0040,1002)	3	No	
Requested Procedure Priority	(0040,1003)	2	Yes	

Attribute Name	Tag	Return Key Type	UI	Notes
Patient Transport Arrangements	(0040,1004)	2	No	
Confidentiality Code	(0040,1008)	3	No	
Reporting Priority	(0040,1009)	3	Yes	
Names of intended Recipients of Results	(0040,1010)	3	No	
Requested Procedure Comments	(0040,1400)	3	No	
Imaging Service Request				
Accession Number	(0008,0050)	2	Yes	
Referring Physician's Name	(0008,0090)	2	Yes	
Requesting Physician	(0032,1032)	2	Yes	
Requesting Service	(0032,1033)	3	No	
Issuing Date of Imaging Service Request	(0040,2004)	3	No	
Issuing Time of Imaging Service Request	(0040,2005)	3	No	
Placer Order Number / Imaging Service Request	(0040,2016)	3	No	Old tag (0040,2006) is retired
Filler Order Number / Imaging Service Request	(0040,2017)	3	No	Old tag (0040,2007) is retired
Order Entered By	(0040,2008)	3	No	
Order Enterer's location	(0040,2009)	3	No	
Order Callback Phone Number	(0040,2010)	3	No	
Imaging Service Request Comments	(0040,2400)	3	No	
Visit Identification				
Admission ID	(0038,0010)	2	Yes	
Issuer of Admission ID	(0038,0011)	3	No	
Institution Name	(0008,0080)	3	No	
Institution Address	(0008,0081)	3	No	
Visit Status				
Current Patient Location	(0038,0300)	2	Yes	
Visit Admission				
Admitting Diagnosis Description	(0008,1080)	3	Yes	
Admitting Date	(0038,0020)	3	No	
Patient Identification				
Patient's Name	(0010,0010)	1	Yes	
Patient ID	(0010,0020)	1	Yes	
Issuer of Patient ID	(0010,0021)	3	No	
Other Patient IDs	(0010,1000)	3	Yes	Retired

Attribute Name	Tag	Return Key Type	UI	Notes
Other Patient Names	(0010,1001)	3	Yes	
Patient's Birth Name	(0010,1005)	3	No	
Patient Demographic				
Patient's Birth Date	(0010,0030)	2	Yes	
Patient's Birth Time	(0010,0032)	3	No	
Patient's Sex	(0010,0040)	2	Yes	
Patient's Insurance Plan Code Sequence	(0010,0050)	3	No	
>Code Value	(0008,0100)	1C	No	
>Coding Scheme Designator	(0008,0102)	1C	No	
>Coding Scheme Version	(0008,0103)	3	No	
>Code Meaning	(0008,0104)	3	No	
Patient's Age	(0010,1010)	3	No	
Patient's Size	(0010,1020)	3	Yes	
Patient's Weight	(0010,1030)	2	Yes	
Patient's Address	(0010,1040)	3	Yes	
Military Rank	(0010,1080)	3	Yes	
Branch of Service	(0010,1081)	3	No	
Ethnic Group	(0010,2160)	3	Yes	
Patient Comments	(0010,4000)	3	Yes	
Patient Medical				
Medical Alerts	(0010,2000)	2	Yes	
Allergies	(0010,2110)	2	Yes	
Pregnancy Status	(0010,21C0)	2	Yes	
Smoking Status	(0010,21A0)	3	Yes	
Last Menstrual Date	(0010,21D0)	3	Yes	
Additional Patient History	(0010,21B0)	3	Yes	
Special Needs	(0038,0050)	2	Yes	

The behavior of the syngo CT VB10A when encountering status codes for all SOP classes listed in Table 1 in a C-FIND-RSP is summarized in Table 43.

Table 43: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process	Any none 0000, FF00 and FF01 Code	Failure reported to user
Pending	All optional keys are supported the same manner as Required Keys.	FF00	Pending state is indicated to user
	Matching Operation continues; some of the optional keys were not supported the same way as the required keys	FF01	Pending state is indicated to user
Success	Query has been performed successfully.	0000	Success reported to user

Table 44 below indicates the behavior if exceptions occur:

Table 44: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.5.4 Association Acceptance Policy

The Modality Worklist AE does not provide the functionality of a SCP of the Modality Worklist – Find SOP Class.

4.2.6 Modality Performed Procedure Step AE Specification

4.2.6.1 SOP Classes

The Modality Performed Procedure Step AE provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "Workflow Management" (Modality Performed Procedure Step SOP Class)" in chapter Conformance Statement Overview.

4.2.6.2 Association Policy

Table 45: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

[1] Default, the value is configurable

The Modality Performed Procedure Step AE contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.6.2.1 Asynchronous Nature

The Modality Performed Procedure Step AE supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 46: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.6.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to Table 3.

4.2.6.3 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.6.3.1 Activity "Send Verification Request"

The Modality Performed Procedure Step AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

4.2.6.3.2 Activity "Create Modality Performed Procedure Step"

4.2.6.3.2.1 Description and Sequencing of Activities

The Modality Performed Procedure Step AE serves as a SCU of the Modality Performed Procedure Step SOP Class. It sends N-CREATE request to inform the Information System that a Procedure Step has been started.

4.2.6.3.2.2 Accepted Presentation Contexts

The syngo CT VB10AModality Performed Procedure Step AE proposes Presentation Contexts as shown in the following table:

Table 47: Acceptable Presentation Contexts Activity "Create MPPS"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.6.3.2.3 SOP specific Conformance for MPPS SOP class

The behavior of Modality Performed Procedure Step AE when encountering status codes for all SOP classes listed in Table 1 in an N-CREATE-RSP is summarized in Table 48:

Table 48: MPPS N-CREATE-RSP Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	MPPS creation request could not be processed.	Any none 0000 Code	MPPS is not created.
Success	MPPS creation request processed successfully.	0000	MPPS is created.

Table 49 shows the attributes supported in the MPPS N-CREATE-RQ message.

Table 49: Attributes supported in MPPS N-CREATE-RQ

Attribute Name	Tag	Value	Comments
Performed Procedure Step Relationship			
Patient's Name	(0010,0010)		
Patient ID	(0010,0020)		
Issuer of Patient ID	(0010,0021)		
Patient's Birth Date	(0010,0030)		
Patient's Sex	(0010,0040)		
Scheduled Step Attributes Sequence	(0040,0270)		
>Accession Number	(0008,0050)		
>Referenced Study Sequence	(0008,1110)		
>>Referenced SOP Class UID	(0008,1150)		
>>Referenced SOP Instance UID	(0008,1155)		
>Study Instance UID	(0020,000D)		
>Requested Procedure Description	(0032,1060)		
>Scheduled Procedure Step Description	(0040,0007)		
>Scheduled Protocol Code Sequence	(0040,0008)		
>Scheduled Procedure Step ID	(0040,0009)		
>Requested Procedure ID	(0040,1001)		
Performed Procedure Step Information			
Procedure Code Sequence	(0008,1032)		
>Code Value	(0008,0100)		
>Coding Scheme Designator	(0008,0102)		
>Coding Scheme Version	(0008,0103)		
>Code Meaning	(0008,0104)		

Attribute Name	Tag	Value	Comments
Performed Station AE Title	(0040,0241)		
Performed Station Name	(0040,0242)		
Performed Location	(0040,0243)		
Performed Procedure Step Start Date	(0040,0244)		
Performed Procedure Step Start Time	(0040,0245)		
Performed Procedure Step End Date	(0040,0250)	empty	
Performed Procedure Step End Time	(0040,0251)	empty	
Performed Procedure Step Status	(0040,0252)	IN PROGRESS	
Performed Procedure Step ID	(0040,0253)		
Performed Procedure Step Description	(0040,0254)		
Performed Procedure Type Description	(0040,0255)		
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	empty	
Image Acquisition Results			
Modality	(0008,0060)	CT	
Study ID	(0020,0010)		
Performed Protocol Code Sequence	(0040,0260)		
Performed Series Sequence	(0040,0340)		
Billing And Material Management Code			
Film Consumption Sequence	(0040,0321)		
Billing Supplies and Devices Sequence	(0040,0324)		

4.2.6.3.3 Activity "Update Modality Performed Procedure Step"

4.2.6.3.3.1 Description and Sequencing of Activities

When the procedure step has been finished, the syngo CT VB10A sends N-SET request to inform the Information System about the finalization of the procedure step (COMPLETED or DISCONTINUED).

Table 50 shows the code values supported in the N-SET-RQ message.

Table 50: Modality PPS Discontinuation Reasons supported

Code Value	Code Meaning
110500	Doctor cancelled procedure

4.2.6.3.3.2 Proposed Presentation Contexts

The Modality Performed Procedure Step AE proposes Presentation Contexts as shown in the following table:

Table 51: Acceptable Presentation Contexts Activity "Update MPPS"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.6.3.3.3 SOP specific Conformance for MPPS SOP class

The behavior of Modality Performed Procedure Step AE when encountering status codes for all SOP classes listed in Table 1 in an N-SET-RSP is summarized in Table 52:

Table 52: MPPS N-SET-RSP Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	MPPS update request could not be processed.	Any none 0000 Code	MPPS is not updated.
Success	MPPS update request could processed successfully.	0000	MPPS is updated.

Table 53: Attributes supported in MPPS N-SET-RQ shows the attributes supported in the MPPS N-SET-RQ message.

Table 53: Attributes supported in MPPS N-SET-RQ

Attribute Name	Tag	Value	Comments
Performed Procedure Step Information			
Procedure Code Sequence	(0008,1032)		
>Code Value	(0008,0100)		
>Coding Scheme Designator	(0008,0102)		
>Coding Scheme Version	(0008,0103)		
>Code Meaning	(0008,0104)		
Performed Procedure Step End Date	(0040,0250)		
Performed Procedure Step End Time	(0040,0251)		
Performed Procedure Step Status	(0040,0252)		
Performed Procedure Step Description	(0040,0254)		
Performed Procedure Type Description	(0040,0255)		
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)		
>Code Value	(0008,0100)		
>Coding Scheme Designator	(0008,0102)		

Attribute Name	Tag	Value	Comments
>Coding Scheme Version	(0008,0103)		
>Code Meaning	(0008,0104)		
Image Acquisition Results			
Performed Protocol Code Sequence	(0040,0260)		
Performed Series Sequence	(0040,0340)		
>Retrieve AE Title	(0008,0054)	empty	
>Series Description	(0008,103E)		
>Performing Physicians Name	(0008,1050)		
>Operator Name	(0008,1070)		
>Referenced Image Sequence	(0008,1140)		
>>Referenced SOP Class UID	(0008,1150)		
>>Referenced SOP Instance UID	(0008,1155)		
>Protocol Name	(0018,1030)		
>Series Instance UID	(0020,000E)	1.3.12.2.1107.5.1.7. *Device Serial Numbe.object-identifier*	
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)		
>>Referenced SOP Class UID	(0008,1150)		
>>Referenced SOP Instance UID	(0008,1155)		
Billing And Material Management Code			
Film Consumption Sequence	(0040,0321)		
Billing Supplies and Devices Sequence	(0040,0324)		
Additional Attributes			
Specific Character Set	(0008,0005)		

4.2.6.4 Association Acceptance Policy

The Modality Performed Procedure Step AE does not provide the functionality of an SCP of the Modality Performed Procedure Step SOP Class.

4.2.7 Print AE Specification

4.2.7.1 SOP Classes

The Print AE provides Standard Conformance to the SOP Classes listed in “Table 1: Network Services” section “Print Management".

4.2.7.2 Association Policy

Table 54: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1

PDU size	32 kB [1]
Maximum number of simultaneous associations as an association acceptor	12[1]
Maximum number of simultaneous associations as an association initiator	unlimited

The Print AE contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.7.2.1 Asynchronous Nature

The Print AE supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 55: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

4.2.7.3 Association Initiation Policy

For general information regarding the association initiation policies please see Chapter 4.2.1.2.

4.2.7.3.1 Activity "Send Verification Request"

The Print AE supports the Verification SOP Class. For further details please see chapter 4.2.1.2.1.

4.2.7.3.2 Activity Print Film

4.2.7.3.2.1 Description and Sequencing of Activities

Whenever a film-sheet is prepared by the user, it is forwarded to the Printer Job queue. As soon as the associated Printer device is available the job is activated, and an association is established.

After he film sheet is internally processed, converted to a STANDARD\1,1 layout and the page image is sent to the printer, the status is controlled by awaiting any N-EVENT-REPORT message throughout the transfer until the last image or film-sheet is sent.

If the response from the remote application contains a status other than Success or Warning the printing is stopped and the job status is set to Aborted.

[1] Default, the value is configurable

4.2.7.3.2.2 Proposed Presentation Context

The Print AE proposes Presentation Contexts as shown in the following table:

Table 56: Presentation Contexts for the Activity "Print Film"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.3.2.3 SOP Specific Conformance

The Print AE conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class.

The application uses a configuration platform to define the properties of the connected DICOM SCP, e.g.:

- supported film sizes of the connected DICOM SCP
- supported film formats of the DICOM SCP

The printing is only suspended in the case of a failure return status of the SCP.

Basic Film Session SOP Class

The Basic Film Session information object definition describes all the user-defined parameters, which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes that are printed on one hardcopy printer.

The Print AE supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Basic Film Session SOP Class N-CREATE-RQ (SCU) uses the attributes listed in the table below:

Table 57: Attributes for the N-CREATE-RQ of the Basic Film Session

Attribute Name	Tag	Supported Values
Number of Copies	(2000,0010)	1
Medium Type	(2000,0030)	BLUE FILM
		CLEAR FILM
		PAPER
		MAMMO BLUE FILM
		MAMMO CLEAR FILM

The Affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Session.

The Basic Film Session SOP class interprets the status codes (from N-CREATE-RSP messages) listed in the table below:

Table 58: N-CREATE-RSP Status Handling Behavior for the Basic Film Session

Service Status	Further Meaning	Error Codes	Behavior
Warning	Memory Allocation not supported	B600	Print job continues, warning is logged
Success	Film session successfully created	0000	Print job continues
Failure	Any other occurrence	Any other error code	The print job fails, the occurrence is logged.

The N-DELETE-RQ on the Basic Film Session SOP Class is used to remove the complete Basic Film Session SOP Instance hierarchy.

Basic Film Box SOP Class

The Basic Film Box information object definition describes all user-defined parameters of one film of the film session including presentation parameters, which are common for all images on a given film sheet.

The Basic Film Box refers to one or more Image Boxes.

The Print AE supports the following DIMSE Service elements for the Basic Film Box SOP Class as SCU:

- N-CREATE
- N-ACTION
- N-DELETE

The Basic Film Box SOP Class N-CREATE-RQ message uses the attributes listed below. The actual values for each attribute depend on DICOM printer configuration within the Print AE:

Table 59: Attributes for the N-CREATE-RQ of the Basic Film Session

Attribute Name	Tag	Usage SCU	Supported Values
Image Display Format	(2010,0010)	M	STANDARD\1,1
Referenced Film Session Sequence	(2010,0500)	M	
> Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
> Referenced SOP Instance UID	(0008,1155)	M	
Film Orientation	(2010,0040)	M	PORTRAIT, LANDSCAPE
Film Size ID	(2010,0050)	M	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM
Magnification Type	(2010,0060)	M	BILINEAR, CUBIC, NONE, REPLICATE
Border Density	(2010,0100)	U	BLACK, WHITE
Max Density	(2010,0130)	U	0 < Value
Min Density	(2010,0120)	U	0 < Value < 50
Required if Presentation LUT is present			
Reflective Ambient Light	(2010,0160)	U	0 < Value
Illumination	(2010,015E)	U	0 < Value
Referenced Presentation LUT Sequence	(2050,0500)	U	

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with SOP Class/Instance UID pairs which will be kept internally to be further used for the subsequent Basic Image Box SOP Class N-SET-RQ messages.

When all Image Boxes (including parameters) for the film-sheet have been set, the syngo CT VB10A print manager will issue an N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box and the Action Type ID of 1.

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g., N-DELETE-RQ) on the Basic Film Box.

The Basic Film Box SOP class interprets the status codes listed in the tables below:

Table 60: N-CREATE-RSP Status Handling Behavior for Basic Film Box

Service Status	Meaning	Error Codes	Behavior
Failure	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed	C616 or any other error code not mentioned below	Print job is marked as failed and the reason is logged
Warning	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead	B605	Print job continues and warning is logged
Success	Film Box successfully created	0000	Print job continues

Table 61: N-ACTION-RSP Status Handling Behavior for Basic Film Box

Service Status	Meaning	Error Codes	Behavior
Failure	Unable to create print job, print queue is full	C602	Print job is marked as failed and the reason is logged
	Image size is larger than images box size	C603	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Film box does not contain image box (empty page)	B603	Print job continues and warning is logged
	Image size is larger than image box size, the image has been demagnified	B604	Print job continues and warning is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Film accepted for printing	0000	Print job continues

Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Grayscale Image Box SOP Class uses only the N-SET-RQ with the attributes listed in the table below:

Table 62: Attributes for N-SET-RQ of Basic Grayscale Image Box

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
Basic Grayscale Image Sequence	(2020,0110)	M	
> Samples per Pixel	(0028,0002)	M	1
> Photometric Interpretation	(0028,0004)	M	MONOCHROME2
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8,16
> Bits Stored	(0028,0101)	M	8,12
> High Bit	(0028,0102)	M	7,11
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Basic Grayscale Image Box SOP class interprets the status codes as listed below:

Table 63: N-SET-RSP Status Handling Behavior for the Basic Grayscale Image Box SOP Class

Service Status	Further Meaning	Error Codes	Behavior
Failure	Image contains more pixel than printer can print in Image Box	C603	Print job is marked as failed and the reason is logged
	Insufficient memory in printer to store the image	C605	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Image size is larger than image box size, the image has been demagnified.	B604	Print job continues and the reason is logged
	Requested MinDensity or MaxDensity outside of Printer's operating range	B605	Print job continues and the reason is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Image successfully stored in Image Box	0000	Print job continues

Basic Color Image Box SOP Class

The Basic Color Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Color Image Box SOP Class uses only the N-SET-RQ with the attributes listed below:

Table 64: Attributes for N-SET-RQ of Basic Color Image Box

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
BASIC Color Image Sequence	(2020,0111)	M	
> Samples per Pixel	(0028,0002)	M	3
> Photometric Interpretation	(0028,0004)	M	RGB
> Planar Configuration	(0028,0006)	M	0
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8
> Bits Stored	(0028,0101)	M	8
> High Bit	(0028,0102)	M	7
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Color Image Box SOP class interprets the status codes listed below:

Table 65: N-SET-RSP Status Handling Behavior for the Color Grayscale Image Box

Service Status	Meaning	Error Codes	Behavior
Failure	Image contains more pixel than printer can print in Image Box	C603	Print job is marked as failed and the reason is logged
	Insufficient memory in printer to store the image	C605	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Image size larger than image box size	B604	Print job continues and the reason is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Image successfully stored in Image Box	0000	Print job continues

Presentation LUT SOP Class

The objective of the Presentation LUT is to realize image hardcopy printing tailored for specific modalities, applications and user preferences.

The output of the Presentation LUT is Presentation Values (P-Values). P-Values are approximately related to human perceptual response. They are intended to facilitate common input for hardcopy. P-Values are intended to be independent of the specific class or characteristics of the hardcopy device.

The Print AE supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Presentation LUT SOP Class uses only the N-CREATE-RQ with the attributes listed below:

Table 66: Attributes for N-CREATE-RQ of Presentation LUT SOP Class

Attribute Name	Tag	Usage SCU	Supported Values
Presentation LUT Shape	(2050,0020)	U	IDENTITY

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and is used for later requests on the Basic Film Box (N-CREATE-RQ) and on the Presentation LUT (N-DELETE-RQ).

The Presentation LUT SOP class interprets the status codes listed below:

Table 67: N-**CREATE-RSP Status Handling Behavior for the Presentation LUT SOP Class**

Service Status	Further Meaning	Error Codes	Behavior
Warning	Requested MinDensity or MaxDensity outside of HCD's operating range. HCD will use its respective minimum or maximum density value instead.	B605	Print job continues and the reason is logged
Success	Presentation LUT successfully created	0000	Print job continues

Printer SOP Class

The Printer SOP Class provides the possibility to monitor the status of the hardcopy printer in a synchronous and in an asynchronous way.

When used synchronously the Print AE uses the N-GET-RQ to request information about the printer status. It uses the attributes listed in the table below.

Table 68: Attributes for N-GET-RQ of the Printer SOP Class

Attribute Name	Tag	Usage SCP	Supported Values
Printer Status	(2110,0010)	M	NORMAL, FAILURE, WARNING
Printer Status Info	(2110,0020)	M	See table in chapter 9.7 for possible values.

The command communication failure behavior listed below applies to all SOP classes used for the "Print Film" activity:

Table 69: DICOM Command Communication Failure Behavior

Exception	Behavior
Association Negotiation Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.7.4 Association Acceptance Policy

For general information regarding the association acceptance policies please see Chapter 4.2.1.3.

4.2.7.4.1 Activity "Receive Printer Status Change Information"

4.2.7.4.1.1 Description and Sequencing of Activities

The Print AE supports the reverse role negotiation of the Printer SOP Class. Receiving the N-EVENT-REPORT-RQ from a printer the Print AE is asynchronously informed about changes of the printer status.

4.2.7.4.1.2 Accepted Presentation Context

The Print AE accepts Presentation Contexts as shown in the following table:

Table 70: Presentation Contexts for the Activity "Receive Printer Status Change Information"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.4.1.3 SOP Specific Conformance

The N-EVENT-REPORT-RSP message provides the printer status information in the Attribute Status (0000,0900). The behavior of Print AE when by processing the N-EVENT-REPORT-RSP message for the Printer SOP Class is summarized in Table 71.

Table 71: Attributes for the N-EVENT-REPORT-RSP of the Printer SOP Class

Service Status	Further Meaning	Error Code	Behavior
Success	The printer is available and ready	1	Print job can process
Warning	The printer has a remediable issue	2	Print job can process, but might not finish successfully
Failure	The printer is not available or not ready	3	The user is notified and the issue is logged

4.2.7.4.2 Activity "Receive Print Job Status Information"

4.2.7.4.2.1 Description and Sequencing of Activities

The Print AE supports the reverse role negotiation of the Print Job SOP Class. Receiving the N-EVENT-REPORT-RQ from a printer the syngo CT VB10A is asynchronously informed about the status of a print job for monitoring its progress.

4.2.7.4.2.2 Accepted Presentation Context

The Print AE accepts Presentation Contexts as shown in the following table:

Table 72: Presentation Contexts for the Activity "Receive Print Job Status Information"

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.4.2.3 SOP Specific Conformance

Attributes that can be handled by the Print AE of the product are listed in the table below.

Table 73: Attributes for the N-EVENT-REPORT-RSP of the Print Job SOP Class

Event Type Name	Event	Attributes	Tag	Usage SCU
Pending	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

4.3 Network Interfaces

4.3.1 Physical Network Interface

The syngo CT VB10A provides DICOM 3.0 TCP/IP network communication support as defined in Part 8 of the DICOM Standard. The network communication is independent from the physical medium over which TCP/IP executes; it inherits this from the Windows OS system upon which it executes.

4.3.2 Additional Protocols

The following network protocols (provided by the operating system) are used as part of the Dicom services: ping, nslookup.

The syngo CT VB10A can act as an NTP Client (based on operating system services)

4.3.3 IPv4 and IPv6 Support

IPv4 and IPv6 are supported. Regarding IPv6 please note, that the complete networking infrastructure in the hospital (firewalls, DNS-Servers, ...) must support IPv6 to get a functioning communication.

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

AE Titles must be unique within the hospital. A common way to achieve that is to use the hostname as part of the AE Titles. The string can be up to 16 characters and must not contain any extended characters. Only 7-bit ASCII characters (excluding Control Characters) are allowed according to the DICOM Standard.

4.4.1.1 Local AE Titles

The syngo CT VB10A allows to configure AE Titles, Ports and Services in any way the user wishes. Default delivery is that all services are using the same AE title and only one port number. In case the connected systems cannot handle this default, the customer Service engineer is able to configure for each Service its own AE title and Port number.

Table 74: AE Titles

Parameter	Configurable	Default Value
Default AE title	Yes	hostname in uppercase characters; limited to 16 characters
Default Basic Port	Yes	104
Default Secure Port	Yes	2762

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Remote Association Initiators

All relevant remote applications that may setup DICOM associations towards ***syngo CT VB10A*** need to be configured in syngo CT VB10A, before the association can be established. This behavior is configurable, but it is recommended, not to change this behavior.

The mapping of external AE Titles to TCP/IP addresses and ports is configurable and initially set at the time of installation-by-installation Personnel. Changes can later also be performed by the local authorized system administrator. The Application Entity Titles and supported transfer syntaxes need to be known for configuration.

To enable a fast and efficient configuration possibility Siemens Healthineers will deliver templates for known configuration examples, so that the behavior (usage of one AE title, default port numbers, supported services) is determined already through the template.

Remote Application Entities can be configured without restarting the process.

4.4.1.2.2 Remote Association Acceptors

For remote applications that shall be able to accept DICOM associations from *syngo CT VB10A*, the following information needs to be available:

- Application Entity Title
- Host Name / IP address on which the remote application service runs
- Port number on which the remote application accepts association requests.

The remote system will be indicated in the UI of *syngo CT VB10A* with a logical name, that is also entered when configuring the node in the administration UI.

To enable a fast and efficient configuration possibility Siemens Healthineers will deliver templates for known configuration examples, so that the behavior (usage of one AE title, default port numbers, supported services) is determined already through the template.

Remote Application Entities can be configured without restarting the process.

4.4.1.3 Secure DICOM Communication

The system supports configuring the DICOM communication to use secure channel (TLS) between syngo CT VB10A and configured remote nodes. As a security measure the certificate thumbprint or certificate trust chain of the remote nodes shall be added (pinned) to the syngo CT VB10A system to authorize the incoming connection.

Detailed instructions how to set up secure DICOM communication are available in the Administrator Online Help.

Note: The default DICOM port will change to 2762.

If the certificate of remote node contains Enhanced Key Usage (Extended Key Usage) field, then:

- If the remote node acts as DICOM SCP it shall contain Server Authentication (1.3.6.1.5.5.7.3.1)
- If the remote node acts as a DICOM SCU it shall contain Client Authentication (1.3.6.1.5.5.7.3.2)

Otherwise syngo CT VB10A will not accept the certificate.

4.4.2 Configuration Parameters - Explanation

Throughout all subsections the following Values can be used in the “Configurable” column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

syngo CT VB10A does not limit the number of the configurable Remote Nodes. This applies to all the DIMSE Services. The communication capability is only limited by the Operation System.

Please note, that having lots of Remote Nodes (2000 or more) can affect the loading speed of the different GUIs.

Both IPv4 and IPv6 are supported.

4.4.3 General Configuration Parameters

Table 75 lists general configuration parameters applicable across all supported DICOM Services.

Table 75: General Configuration Parameters

Parameter	Configurable	Default Value	Comments
General Parameters			
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Application-Level timeout)	USER	30 seconds	Value range: 1 – 120 seconds
Timeout waiting for a response to an Association release request (Application-Level Timeout)	USER	30 seconds	Value range: 1 – 120 seconds The value of the timeout waiting for acceptance or rejection Response to an Association Open Request will be used.
General DIMSE level timeout Values	USER	30 Seconds	Value range 1 – 300 seconds
TCP/IP Settings			
TCP/IP Send Buffer	FIXED	65535 Bytes	
TCP/IP Receive Buffer	FIXED	65535 Bytes	
TCP/IP Socket Timeout	USER	5 seconds	Value range: 1 – 60 Seconds.
Maximum PDU size	USER	32 KB	Value range: 16 – 512 KB
DICOM Services Parameters			
Maximum number of simultaneous Associations accepted	SERVICE		Please find the data in the respective chapters describing the Service.
Specific Character Set	USER	ISO IR 100	

Please do note, that the default values and some of the value ranges are provided by the templates for the different Remote Nodes of different types. The set of templates is extendable. This is applicable for the general and special parameters.

4.4.4 Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.

To identify whether syngo CT VB10A is an SCP and / or an SCU, the following applies:

- SCP: The (Secured) Local Called AET and Remote Calling AET parameters are present.
- SCU: The (Secured) Local Calling AET and Remote Called AET parameters are present.

Throughout all subsections the following Values can be used in the “Configurable” column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

syngo CT VB10A does not limit the number of the configurable Remote Nodes. This applies to all the DIMSE Services. The communication capability is only limited by the Operation System.

Please note, that having lots of Remote Nodes (2000 or more) can affect the loading speed of the different GUIs.

Both IPv4 and IPv6 are supported.

4.4.4.1 Basic Worklist Management Service Configuration

Table 76 lists Worklist Service configuration parameters:

Table 76: Worklist Service Parameters

Local Configuration Parameters – Worklist			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	The machine name	
Only allow encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Logical Name	SERVICE		
Location	SERVICE		
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Worklist provider (DIS)	SERVICE	None	A Remote Node can be selected from the list of Remote Nodes, which do have configured a Worklist AE as SCP.
Query interval	SERVICE	0 Minutes	The default setting (0 Minute) means, that no query will be initiated (off).
Time to keep unassigned worklist items after disappearance from DIS	SERVICE	180 Minutes	
Time window for scheduled procedure step start date	SERVICE	1 day into the past 1 day into the future	
Worklist Query Attributes and their Values	SERVICE		The user can select the return key attributes for Worklist Queries.
Matching criteria to use for Worklist Query	SERVICE		The user can add matching criteria for Modality (0008.0060), Application Entity Title (0040,0001) and Performing Physician (0040,0006). The user can select two additional DICOM Tag from a list and provide some matching criteria for them.
Remote Configuration Parameters – Worklist			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	SERVICE		
Port	SERVICE	1024	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Hostname	SERVICE		
IP Address	SERVICE		
Use encrypted DICOM communication for outgoing connections	SERVICE	(not set)	

4.4.4.2 Modality Performed Procedure Step Service Configuration

Table 77 lists Modality Performed Procedure Step Service configuration parameters:

Table 77: MPPS Service Parameters

Local Configuration Parameters – MPPS			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERIVCE	The machine name	
Called AE Title (SCP)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65536
TLS-Secured-Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		The physical location of the machine representing the Remote Node.
Only allow encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – MPPS			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	SERVICE		
Port	SERVICE	5207	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Send procedure step to <Remote Node Name> when requested procedure was scheduled from <Worklist provider (DIS)>	SERVICE	(none selected)	For every Worklist Provider Remote Node (DIS) one line is displayed. Every line or none can be selected.
Send procedure step to <Remote Node> when requested procedure was unscheduled (locally generated)	SERVICE	(none selected)	For every Worklist Provider Remote Node (DIS) one group is displayed. Every line or none can be selected.
For <Remote Node Name> send progress notification to this destination	SERVICE	(selected)	
For <Remote Node Name> send MMPS messages to this destination even after completion	SERVICE	(selected)	

4.4.4.3 Storage Service Configuration

Table 78 lists Storage Service configuration parameters:

Table 78: Storage Service Parameters

Local Configuration Parameters – Storage			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	The machine name	
Called AE Title (SCP)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for incoming connections	SERVICE	false	If set, the Local Node will only accept encrypted communication (TLS handshake).
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Transfer Syntax Optimization	SERVICE	Uncompressed Format (low CPU load)	The user can select, if syngo CT VB10A should favor compressed or uncompressed syntax.
Remote Configuration Parameters – Storage			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE		
Called AE Title (SCP)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Transfer Syntaxes to be Excluded (SCU)	SERVICE		Transfer Syntaxes can be excluded for all SOP Classes or for specific SOP Classes. If excluded, no Association Request with the excluded Transfer Syntaxes will be sent.
Header Correction Ruleset (SCU)	SERVICE		The selected Header Correction Ruleset will be applied for DICOM Data to be sent. Beside a default list of Header Correction Ruleset, the User can define own Header Correction Rulesets.
Storage Commitment (SCU)	SERVICE	ENABLED	If Storage Commitment is disabled, the archive state is only updated based on the transfer result. Permanent data storage is not ensured, and data loss may result.
Encapsulate Non-Supported Objects (SCU)	SERVICE	ENABLED (Basic Text Structured Report Format)	If the User enable this option, non-supported objects will be encapsulated in the "Basic Text Structured Report" or "Secondary Capture Image" format depending on the user's selection.
Transfer Syntaxes to be Excluded (SCP)	SERVICE		Transfer Syntaxes can be excluded for all SOP Classes or for specific SOP Classes.

			Presentation Contexts for excluded Transfer Syntaxes in incoming Association Requests will be rejected.
Header Correction Ruleset (SCP)	SERVICE		The selected Header Correction Ruleset will be applied for DICOM Data received. Beside a default list of Header Correction Ruleset, the User can define own Header Correction Rulesets.
Series Complete Delay (SCP)	SERVICE	0	Delay between a Receive Job is finished, and the received series are considered as complete

4.4.4.4 Storage Commitment Service Configuration

Table 79 lists Storage Commitment Service configuration parameters:

Table 79: Storage Commitment Service Parameters

Local Configuration Parameters – Storage Commitment			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	The machine name	
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – Storage Commitment			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Timeouts and Retries – Delay Time	SERVICE	10 Minutes	Value range: 0 – 14400 Minutes
Timeouts and Retries – Result Timeout	SERVICE	60 Minutes	Value range: 0 – 14400 Minutes
Timeouts and Retries – Number of Retries	SERVICE	1	Value range 1 – 100
Sending of N-Action - Bundled Call	SERVICE	ENABLED	This setting determines whether the system will send an N-Action for each object separately or bundled per transfer job.

4.4.4.5 Query/Retrieve Service Configuration

Table 80 lists Query/Retrieve Service configuration parameters:

Table 80: Query/Retrieve Service Parameters

Local Configuration Parameters – Query/Retrieve			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	The machine name	
Called AE Title (SCP)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – Query/Retrieve			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE		
Called AE Title (SCP)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		

4.4.4.6 Print Management Service Configuration

Table 81 lists Print Management Service configuration parameters:

Table 81: Print Management Service Parameters

Local Configuration Parameters – Print			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	The machine name	
Logical Name	SERVICE		If this is set, the user will see the Logical Name in the list of the Remote Nodes (otherwise the Host Name).
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Look Up Tables (LUT)	SERVICE		For every image type the user can select a Correction Look Up Table and a Density. The standard set of Look Up Tables can be extended by the consumer of <program>
Remote Configuration Parameters – Print			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	SERVICE		
Port	SERVICE	104	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	If set, the Local Node will only accept encrypted communication (TLS handshake).
Hostname	SERVICE		
IP Address	SERVICE		
Composing Parameter – Attached LUT Mode	SERVICE	LinearLut 12 bit support	Value range: LinearLut, BartenLut, CorrectionLut. For every LUT Mode the user can select 8 or 12 bit support
Composing Parameter – Illumination	SERVICE	2000 cd/m²	Value range: 1 – 10000 cd/m² This value can only be set, if the Attached LUT Mode is set to BartenLut.
Composing Parameter – Reflected Ambient Light	SERVICE	10 cd/m²	Value range: 0 – 100000 cd/m² This value can only be set, if the Attached LUT Mode is set to BartenLut.
Composing Parameter – Supported Films/Papers	SERVICE	(all selected)	The user can select, which Films and/or Papers are supported. For each format the width and height (both for Portrait and Landscape format) and the Medium (Paper, ColorPaper, ClearFilm, BlueFilm) can be selected.
Supported Mediums	SERVICE	ColorPaper selected	The user can select the Supported Media and for each one the Pixel Width and Height in µm, Min and Max Density and the Background Color (White or Black)
Timeout & Delay – Printer Status Polling Interval	SERVICE	300 Seconds	Value range: 60 – 300 Seconds
Timeout & Delay – Inactivity Timeout	SERVICE	60 Seconds	Value range: 5 – 180 Seconds

4.4.5 Configuration of Media Storage Service

Table 82 lists configuration parameters for the Media Storage service.

Table 82: Media Storage Service Parameters

Local Configuration Parameters - Media Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Default Media Compression	SERVICE	Priority 1: JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14) Priority 2: (not set) Priority 3: (not set)	The values can be selected from a list. All three values must be different or not set.
DICOM Export Path	SERVICE	(not set)	Beside entering the target path of the export operation, the user can select from a list pre-defined DICOM Export Path values.
Compressed	SERVICE	not set	If set, the first fitting compression algorithm will be selected from the Default Media Compression list. If nothing fits, no compression will take place.
Create DICOM File System	SERVICE	set	If set, the export will create a DICOM File System. If not set, the data will be exported in the selected directory as one file per instance.
Include Image Viewer on Disc	SERVICE	not set	If set, a viewer will be placed on the target medium. This option is only available, if a DICOM File System is created.
Image Conversion	SERVICE	Enhanced	This option is only relevant if MR Multiframe images are exported. Setting it to Enhanced will result in the exportation of MR Multiframe Images as they are. Setting it to Interoperability will result in the exportation of MR Multiframe Image split up.
Data Minimization	SERVICE	not set	If set, a data minimization of the exported data takes place.
Profile	SERVICE	High Privacy	Only relevant if Data Minimization is set. Selects the type of the Data Minimization to be applied. High Privacy, Reduced Privacy and Low Privacy.
Pseudonym	SERVICE	(not set)	Specifies the Pseudonym that is going to be used in the Data Minimization process.
Media Burning Profiles	SERVICE	Patient Medium	It is an extendable list of profiles, which contain a set of following settings: Compressed, Create DICOM Files System, Include Image Viewer on Disc, Image Conversion, Data Minimization, Profile and Pseudonym. Those Profiles are only used by burning data on optical drives.

4.4.6 Configuration of Audit Trail - Syslog

Audit Trails can be created locally and remotely. The last one consists of sending the log records to an external server. The remote logging can be switched on or off. This does not affect the local logging behavior.

Table 83 lists configuration parameters for the Audit Trail Originator.

Table 83: Audit Trail Collector Parameters

Originator Audit Trail Message Transmission-SYSLOG Parameters			
Parameter	**Configurable**	**Default Value**	**Comments**
Host Name	SERVICE		This is the name of the *remote* host.
Port	SERVICE	0	
Protocol	SERIVCE	TCP	The possible values are: Secure TCP, TCP and UDP
Certificate Thumbprint	SERVICE		

4.4.7 Support of DICOM Supplement 188

syngo CT VB10A provides an option in the Clinical Configuration Panel->Advanced Visualization->Global Configuration where the support of DICOM Supplement 188 (Multi Energy) can be enabled.

5 Media Interchange

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

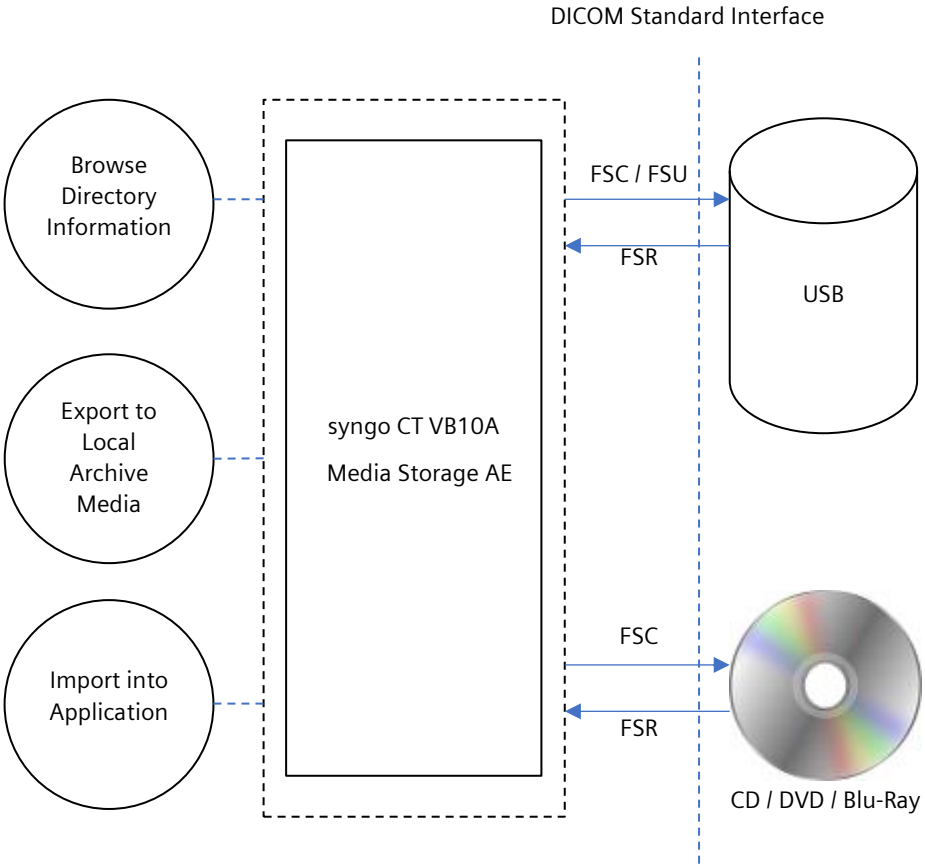


Figure 5: Media Interchange Application Data Flow Diagram

The syngo CT VB10A provides the functionality to Import or Export DICOM Instances from and to the File System. During export, a DICOMDIR will be generated. A complete ISO Image ready-to-burn can also be generated. All SOP Classes defined in Table 1: Network Services are supported for the Import/Export functionality.

5.1.2 Functional Definitions of AEs

The Media Storage AE is capable of

- providing browsing windows for Import from and Export to the File System
- creating a new File-set in the File System (Export to ...)
- importing SOP Instances from the medium onto local storage
- writing the File-sets DICOMDIR information into the file system and joining it to an ISO image.

5.1.3 Sequencing of Real World Activities

Whenever data is written to an external media, ***syngo CT VB10A*** creates a DICOMDIR from the selected data and creates an ISO image of the selected data on the local hard disk. Depending on the selected data and options (selected media size, with or without compression) General Purpose CD- DVD or BluRay profiles are used.

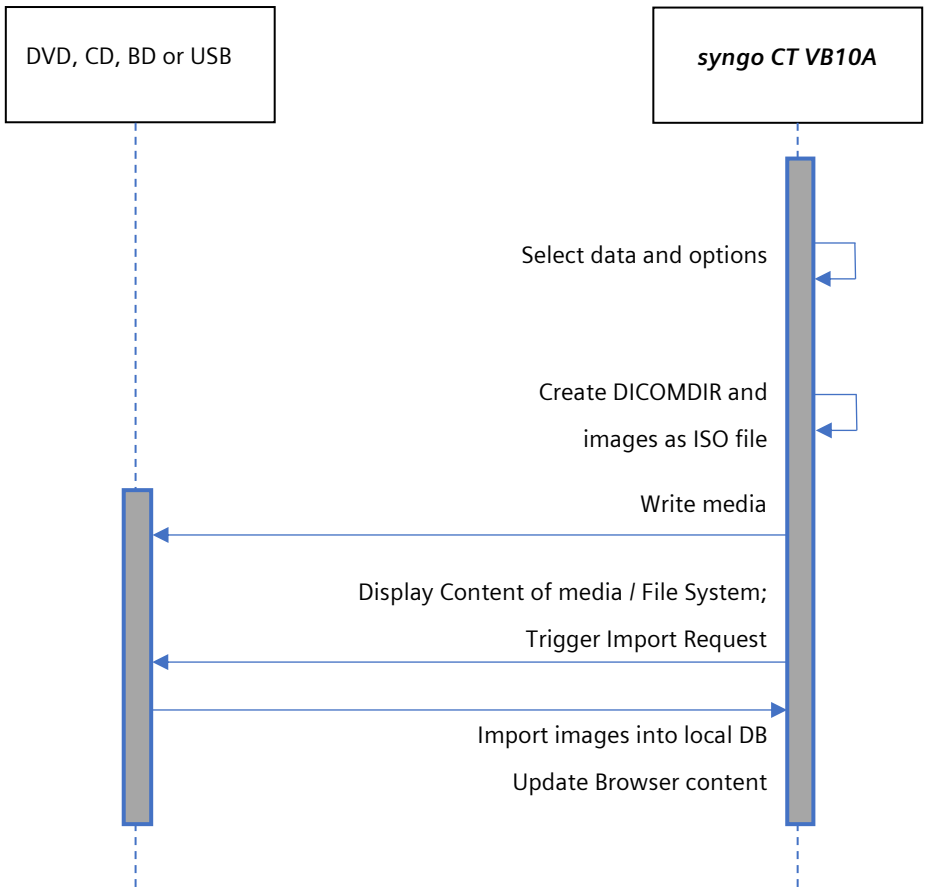


Figure 6: Sequence diagram – Media creation and import

5.1.4 File Meta Information for Implementation Class and Version

This section describes the values assigned to the File Meta Information attributes (see part PS 3.10) that pertain to the Implementation Class and Version. The implementation Class UID and the Implementation Version name in the File Meta Header are the same as the values specified for networking.

Table 84: Implementation Class/Version Name - Media Interchange

File Meta Information Version	00\01
Implementation Class UID	1.3.12.2.1107.5.1.7
Implementation Version Name	SIEMENS_S10VB10A

5.2 AE Specifications

5.2.1 Media Storage AE – Specification

The *syngo CT VB10A* provides conformance to the following Application Profiles as an FSC as well as an FSR. The FSU role is only supported on a non-optical storage device (e.g. USB stick).

In addition augmented conformance is provided to store extra data objects important for the full feature support of the *syngo*-based products. Details are listed below:

Table 85: Media - Application Profiles and Real-World Activities

Application Profile Supported	Real World Activity	Role	Service Class Option
Compact Disk – Recordable			
STD-GEN-CD	Browse Directory Information Import into Application Export to local Archive Media	FSC	Interchange
AUG-GEN-CD		FSC, FSR	
DVD			
STD-GEN-DVD-RAM	Browse Directory Information Import into Application Export to local Archive Media	FSC	Interchange
STD-GEN-DVD- JPEG			
STD-GEN-DVD- J2K			
AUG-GEN-DVD-RAM		FSC, FSR	
Blue Ray			
STD-GEN-BD	Browse Directory Information Import into Application Export to local Archive Media	FSC	Interchange
STD-GEN-BD- JPEG			
STD-GEN-BD- J2K			
AUG-GEN-BD-JPEG		FSC, FSR	
AUG-GEN-BD-J2K			
USB			
STD-GEN-USB	Browse Directory Information Import into Application Export to local Archive Media	FSC, FSR, FSU	Interchange
STD-GEN-USB-JPEG			
STD-GEN-USB-J2K			
AUG-GEN-USB-J2K		FSC, FRS, FSU	

5.2.1.1 Real-World Activities

5.2.1.1.1 Activity "Browse Directory Information"

The *syngo CT VB10A* acts as FSR using the interchange option when requested to read the media directory.

The *syngo CT VB10A* will read the DICOMDIR and insert those directory entries that are valid, into a local database. The database then is used for browsing media contents.

Note: The "Icon Image Sequence" is also supported in DICOMDIR. But only those Icon Images with "Bits Allocated" (0028,0100) equal to 8 and size of 64x64 or 128x128 pixels are imported into database and are visible in the Browser.

5.2.1.1.2 Activity "Import into Application"

The *syngo CT VB10A* application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the application.

The SOP Instance selected from the media directory will be copied into the running Application. Only SOP Instances, that are valid for the application profile supported and supported by syngo CT VB10A can be retrieved from media.

5.2.1.1.3 Activity "Export to local Archive Media"

The syngo CT VB10A application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive Medium. The activity as FSU is only possible as long as the local burning SW of syngo CT VB10A has not already processed the generated ISO file.

The syngo CT VB10A application will receive a list of SOP Instances to be copied to the local archive medium. Depending on the profile selected (Standard: uncompressed, with DICOMDIR; Patient: compressed with DICOMDIR) the SOP Instances will be taken, and an ISO file is being generated that includes the DICOMDIR and the corresponding objects.

It is then up to syngo CT VB10A local configuration (if equipped with a local media burner) to burn the ISO file to the appropriate media.

5.2.1.2 SOP Classes and Transfer Syntaxes

These Application Profiles are based on the Media Storage Service Class with the Interchange Option. The syngo CT VB10A provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "SOP Classes Created by the syngo CT VB10A" and "SOP Classes Managed by the syngo CT VB10A".

Using the Application Profiles supporting compression the following Transfer Syntaxes are supported:

Table 86: Transfer Syntaxes for supported compression (see Table 85: Media - Application Profiles and Real-World Activities)

UID value	Transfer Syntax	Image Objects	Non-Image Objects
1.2.840.10008.1.2.1	Explicit VR Little Endian	Yes	Yes
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1)	Yes	No
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4)	Yes	No
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	Yes	No
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only)	Yes	No
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression	Yes	No
1.2.840.10008.1.2.5	RLE Lossless	Yes	No

Using the Application Profiles that do not support compression only Explicit VR Little Endian (1.2.840.10008.1.2.1) is supported.

5.3 Augmented and Private Application Profiles

The standard application profiles are augmented with private object Siemens Healthineers CSA Non-Image.

Table 87: Private SOP Classes and Transfer Syntaxes for Augmented Media Profiles

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC	FSR
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Explicit VR Little Endian 1.2.840.10008.1.2.1	O	M

Legend:

- O: Optional Key Attribute

The Siemens Healthineers non-image is typically used for raw data and 3D private data.

5.4 Media Configuration

N/A

6 Transformation of DICOM to CDA

N/A

7 Support of Extended Character Sets

The syngo CT VB10A DICOM application supports the following character sets as defined in the four tables below:

Table 88: Single-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Default repertoire	None	ISO-IR 6	ISO 646:
Latin alphabet No. 1	ISO_IR 100	ISO-IR 100	Supplementary set
		ISO-IR 6	ISO 646:
Latin alphabet No. 2	ISO_IR 101	ISO-IR 101	Supplementary set
		ISO-IR 6	ISO 646
Latin alphabet No. 3	ISO_IR 109	ISO-IR 109	Supplementary set
		ISO-IR 6	ISO 646
Latin alphabet No. 4	ISO_IR 110	ISO-IR 110	Supplementary set
		ISO-IR 6	ISO 646
Cyrillic	ISO_IR 144	ISO-IR 144	Supplementary set
		ISO-IR 6	ISO 646
Arabic	ISO_IR 127	ISO-IR 127	Supplementary set
		ISO-IR 6	ISO 646
Greek	ISO_IR 126	ISO-IR 126	Supplementary set
		ISO-IR 6	ISO 646
Hebrew	ISO_IR 138	ISO-IR 138	Supplementary set
		ISO-IR 6	ISO 646
Latin alphabet No. 5 Turkish	ISO_IR 148	ISO-IR 148	Supplementary set
		ISO-IR 6	ISO 646
Japanese	ISO_IR 13	ISO-IR 13	JIS X 0201: Katakana
		ISO-IR 14	JIS X 0201: Romaji
Thai	ISO_IR 166	ISO-IR166	TIS 620-2533 (1990)
		ISO-IR 6	ISO 646

Table 89: Single-Byte Characters Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Default repertoire	ISO 2022 IR 6	ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.1	ISO 2022 IR 100	ISO 2022	ESC 02/13 04/01	ISO-IR 100	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.2	ISO 2022 IR 101	ISO 2022	ESC 02/13 04/02	ISO-IR 101	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.3	ISO 2022 IR 109	ISO 2022	ESC 02/13 04/03	ISO-IR 109	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.4	ISO 2022 IR 110	ISO 2022	ESC 02/13 04/04	ISO-IR 110	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Japanese	ISO 2022 IR 13	ISO 2022	ESC 02/09 04/09	ISO-IR 13	JIS X 0201: Katakana
		ISO 2022	ESC 02/08 04/10	ISO-IR 14	JIS X 0201: Romaji

Multi-Byte Character Sets without Code Extension

Table 90: Multi-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Unicode	ISO_IR 192	ISO 10646	Unicode in UTF-8
Chinese	GB18030	GB18030	GB 18030-2000 (China Association for Standardization)

Table 91: Multi-Byte Character Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Japanese	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	ISO_IR 159	JIS X 0212: Supplementary Kanji set
	ISO 2022 IR 87	ISO 2022	ESC 02/04 04/02	ISO-IR 87	JIS X 0208-1983
Korean	ISO 2022 IR 149	ISO 2022	ESC 02/04 02/09 04/03	ISO-IR 149	KS X 1001: Hangul and Hanja

The syngo CT VB10A supports Kanji characters in the Japanese character set JIS X 0208 in the byte zones after 74 those are 79, 7A, 7B and 7C.

All Specific Character Sets (SCS) listed above are supported for incoming Data. When creating new Instances, the system will use the default SCS (or SCS List) configured on the machine or, if the new instance is created from data originated from a Modality Worklist, the SCS value from the respective data is used.

When there is a mismatch between the given character set in attribute (0008,0005) and the characters in an IOD received by the system, then the following measures are taken to make the characters DICOM conform:

- Convert each illegal character to '?'

There are three categories of character sets which have to be differentiated because of their different encoding formats:

- Conventional ISO character sets: ISO_IR 6, ISO 2022 IR 6, ISO_IR 100, etc.
  → encoded in ISO 2022
- ISO_IR 192 → encoded in UTF-8
- GB18030 → encoded in GB18030

It is not possible to recognize the following mismatches automatically on receiving or importing:

- An attribute value is encoded in ISO_IR 192 ←→ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in GB18030 ←→ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains ISO_IR 192
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains GB18030

An IOD that contains one of the above mentioned inconsistencies is not DICOM conform. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted.

8 Security

8.1 Security Profiles

8.1.1 Basic TLS Secure Transport Connection Profile

Basic TLS Secure Transport Connection Profile supports TLS version 1.0, 1.1 and 1.2 protocols with the following features:

Table 92: Secure Transport Connection Profiles

Supported TLS Feature	Mechanism
Entity Authentication	RSA based certificates
Exchange of Master Secrets	RSA
Data Integrity	SHA
Privacy	Triple DES EDE, CBC

The default secure DICOM port is 2762 (can be reconfigured).

8.2 Association Level Security

It is possible to configure whether the SCP will only answer to known AETs or to any AET.

8.3 Application Level Security

- User must login with own password
- For configuration and Maintenance, Service Technician must login with a separate password.

8.3.1 Attribute confidentiality profiles – Data Minimization

The syngo CT VB10A application can minimize the data exported to Media. Three different levels of data minimization are supported:

- High Privacy
- Reduced Privacy
- Low Privacy

The user needs to select the appropriate data minimization level during export.

Handling public attributes during data minimization:

- Attributes listed in Table 93: Application Level Confidentiality Profile attributes (standard tags) will be affected by the data minimization as specified for the different levels. Attributes not listed in the table are not PII / PHI relevant and will not be affected by the data minimization.

Handling private attributes during data minimization:

- Hight Privacy: private attributes are not included
- Reduced Privacy: private attributes are not included except for the tags listed in Table 93 and Table 94. Retains longitudinal temporal information with full dates and retains patient characteristic (for example: age, size, weight, pregnancy status...). By combining indirect patient identifiers (as age, size, weight and examination date) with external information, the patient can be re-identifiable.
- Low Privacy: all private attributes are included except for the tags listed in Table 93 and Table 94

In the following table for attributes marked with:

- 'Yes' - affected by data minimization
- 'No' - not affected by data minimization

Table 93: Application Level Confidentiality Profile attributes (standard tags)

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0000,1000)	Affected SOP Instance UID	Yes	Yes	No
(0000,1001)	Requested SOP Instance UID	Yes	Yes	No
(0002,0003)	Media Storage SOP Instance UID	Yes	Yes	No
(0004,1511)	Referenced SOP Instance UID in File	Yes	Yes	No
(0008,0014)	Instance Creator UID	Yes	Yes	No
(0008,0015)	Instance Coercion DateTime	Yes	No	No
(0008,0018)	SOP Instance UID	Yes	Yes	No
(0008,0020)	Study Date	Yes	No	No
(0008,0021)	Series Date	Yes	No	No
(0008,0022)	Acquisition Date	Yes	No	No
(0008,0023)	Content Date	Yes	No	No
(0008,0024)	Overlay Date	Yes	No	No
(0008,0025)	Curve Date	Yes	No	No
(0008,002A)	Acquisition DateTime	Yes	No	No
(0008,0030)	Study Time	Yes	No	No
(0008,0031)	Series Time	Yes	No	No
(0008,0032)	Acquisition Time	Yes	No	No
(0008,0033)	Content Time	Yes	No	No
(0008,0034)	Overlay Time	Yes	No	No
(0008,0035)	Curve Time	Yes	No	No
(0008,0050)	Accession Number	Yes	Yes	No
(0008,0058)	Failed SOP Instance UID List	Yes	Yes	No
(0008,0080)	Institution Name	Yes	Yes	No
(0008,0081)	Institution Address	Yes	Yes	No
(0008,0082)	Institution Code Sequence	Yes	Yes	No
(0008,0090)	Referring Physician's Name	Yes	Yes	Yes
(0008,0092)	Referring Physician's Address	Yes	Yes	Yes
(0008,0094)	Referring Physician's Telephone Numbers	Yes	Yes	Yes
(0008,0096)	Referring Physician's Identification Sequence	Yes	Yes	No
(0008,010D)	Context Group Extension Creator UID	Yes	Yes	No
(0008,0201)	Time zone Offset From UTC	Yes	No	No
(0008,1010)	Station Name	Yes	Yes	Yes
(0008,1030)	Study Description	Yes	Yes	No
(0008,103E)	Series Description	Yes	Yes	No
(0008,1040)	Institutional Department Name	Yes	Yes	No
(0008,1048)	Physician(s) of Record	Yes	Yes	Yes

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0008,1049)	Physician(s) of Record Identification Sequence	Yes	Yes	No
(0008,1050)	Performing Physicians' Name	Yes	Yes	Yes
(0008,1052)	Performing Physicians' Identification Sequence	Yes	Yes	No
(0008,1060)	Name of Physician(s) Reading Study	Yes	Yes	Yes
(0008,1062)	Physician Reading Study Identification Sequence	Yes	Yes	No
(0008,1070)	Operators' Name	Yes	Yes	Yes
(0008,1072)	Operators' Identification Sequence	Yes	Yes	No
(0008,1080)	Admitting Diagnoses Description	Yes	Yes	No
(0008,1084)	Admitting Diagnoses Code Sequence	Yes	Yes	No
(0008,1110)	Referenced Study Sequence	Yes	No	No
(0008,1111)	Referenced Performed Procedure Step Sequence	Yes	No	No
(0008,1120)	Referenced Patient Sequence	Yes	Yes	No
(0008,1140)	Referenced Image Sequence	Yes	No	No
(0008,1155)	Referenced SOP Instance UID	Yes	Yes	No
(0008,1195)	Transaction UID	Yes	Yes	No
(0008,2111)	Derivation Description	Yes	No	No
(0008,2112)	Source Image Sequence	Yes	No	No
(0008,3010)	Irradiation Event UID	Yes	Yes	No
(0008,4000)	Identifying Comments	Yes	Yes	No
(0008,9123)	Creator Version UID	Yes	Yes	No
(0010,0010)	Patient's Name	Yes	Yes	Yes
(0010,0020)	Patient ID	Yes	Yes	Yes
(0010,0021)	Issuer of Patient ID	Yes	Yes	No
(0010,0030)	Patient's Birth Date	Yes	Yes	Yes
(0010,0032)	Patient's Birth Time	Yes	Yes	No
(0010,0040)	Patient's Sex	Yes	No	No
(0010,0050)	Patient's Insurance Plan Code Sequence	Yes	Yes	Yes
(0010,0101)	Patient's Primary Language Code Sequence	Yes	Yes	Yes
(0010,0102)	Patient's Primary Language Modifier Code Sequence	Yes	Yes	Yes
(0010,1000)	Other Patient IDs	Yes	Yes	Yes
(0010,1001)	Other Patient Names	Yes	Yes	Yes
(0010,1002)	Other Patient IDs Sequence	Yes	Yes	Yes
(0010,1005)	Patient's Birth Name	Yes	Yes	Yes
(0010,1010)	Patient's Age	Yes	No	No
(0010,1020)	Patient's Size	Yes	No	No
(0010,1030)	Patient's Weight	Yes	No	No
(0010,1040)	Patient Address	Yes	Yes	Yes

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0010,1050)	Insurance Plan Identification	Yes	Yes	No
(0010,1060)	Patient's Mother's Birth Name	Yes	Yes	Yes
(0010,1080)	Military Rank	Yes	Yes	No
(0010,1081)	Branch of Service	Yes	Yes	No
(0010,1090)	Medical Record Locator	Yes	Yes	No
(0010,1100)	Referenced Patient Photo Sequence	Yes	Yes	No
(0010,2000)	Medical Alerts	Yes	Yes	No
(0010,2110)	Allergies	Yes	Yes	No
(0010,2150)	Country of Residence	Yes	Yes	No
(0010,2152)	Region of Residence	Yes	Yes	No
(0010,2154)	Patient's Telephone Number	Yes	Yes	Yes
(0010,2160)	Ethnic Group	Yes	No	No
(0010,2180)	Occupation	Yes	Yes	No
(0010,21A0)	Smoking Status	Yes	No	No
(0010,21B0)	Additional Patient's History	Yes	Yes	Yes
(0010,21C0)	Pregnancy Status	Yes	No	No
(0010,21D0)	Last Menstrual Date	Yes	No	No
(0010,21F0)	Patient's Religious Preference	Yes	Yes	No
(0010,2203)	Patient Sex Neutered	Yes	No	No
(0010,2297)	Responsible Person	Yes	Yes	No
(0010,2299)	Responsible Organization	Yes	Yes	No
(0010,4000)	Patient Comments	Yes	Yes	Yes
(0018,0010)	Contrast Bolus Agent	Yes	Yes	No
(0018,1000)	Device Serial Number	Yes	Yes	No
(0018,1002)	Device UID	Yes	Yes	No
(0018,1004)	Plate ID	Yes	Yes	No
(0018,1005)	Generator ID	Yes	Yes	No
(0018,1007)	Cassette ID	Yes	Yes	No
(0018,1008)	Gantry ID	Yes	Yes	No
(0018,1030)	Protocol Name	Yes	Yes	No
(0018,1400)	Acquisition Device Processing Description	Yes	Yes	No
(0018,2042)	Target UID	Yes	Yes	No
(0018,4000)	Acquisition Comments	Yes	Yes	No
(0018,700A)	Detector ID	Yes	Yes	No
(0018,9424)	Acquisition Protocol Description	Yes	Yes	No
(0018,9516)	Start Acquisition DateTime	Yes	No	No
(0018,9517)	End Acquisition DateTime	Yes	No	No
(0018,A003)	Contribution Description	Yes	Yes	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0020,000D)	Study Instance UID	Yes	Yes	No
(0020,000E)	Series Instance UID	Yes	Yes	No
(0020,0010)	Study ID	Yes	Yes	No
(0020,0052)	Frame of Reference UID	Yes	Yes	No
(0020,0200)	Synchronization Frame of Reference UID	Yes	Yes	No
(0020,3401)	Modifying Device ID	Yes	Yes	No
(0020,3404)	Modifying Device Manufacturer	Yes	Yes	No
(0020,3406)	Modified Image Description	Yes	Yes	No
(0020,4000)	Image Comments	Yes	Yes	No
(0020,9158)	Frame Comments	Yes	Yes	No
(0020,9161)	Concatenation UID	Yes	Yes	No
(0020,9164)	Dimension Organization UID	Yes	No	No
(0028,1199)	Palette Color Lookup Table UID	Yes	Yes	No
(0028,1214)	Large Palette Color Lookup Table UID	Yes	Yes	No
(0028,4000)	Image Presentation Comments	Yes	Yes	No
(0032,0012)	Study ID Issuer	Yes	Yes	No
(0032,1020)	Scheduled Study Location	Yes	Yes	No
(0032,1021)	Scheduled Study Location AE Title	Yes	Yes	No
(0032,1030)	Reason for Study	Yes	Yes	No
(0032,1032)	Requesting Physician	Yes	Yes	No
(0032,1033)	Requesting Service	Yes	Yes	No
(0032,1060)	Requested Procedure Description	Yes	Yes	No
(0032,1070)	Requested Contrast Agent	Yes	Yes	No
(0032,4000)	Study Comments	Yes	Yes	No
(0038,0004)	Referenced Patient Alias Sequence	Yes	Yes	No
(0038,0010)	Admission ID	Yes	Yes	No
(0038,0011)	Issuer of Admission ID	Yes	Yes	No
(0038,001E)	Scheduled Patient Institution Residence	Yes	Yes	No
(0038,0020)	Admitting Date	Yes	No	No
(0038,0021)	Admitting Time	Yes	No	No
(0038,0040)	Discharge Diagnosis Description	Yes	Yes	No
(0038,0050)	Special Needs	Yes	Yes	No
(0038,0060)	Service Episode ID	Yes	Yes	No
(0038,0061)	Issuer of Service Episode ID	Yes	Yes	No
(0038,0062)	Service Episode Description	Yes	Yes	No
(0038,0300)	Current Patient Location	Yes	Yes	No
(0038,0400)	Patient's Institution Residence	Yes	Yes	No
(0038,0500)	Patient State	Yes	Yes	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0038,4000)	Visit Comments	Yes	Yes	No
(0040,0001)	Scheduled Station AE Title	Yes	Yes	No
(0040,0002)	Scheduled Procedure Step Start Date	Yes	No	No
(0040,0003)	Scheduled Procedure Step Start Time	Yes	No	No
(0040,0004)	Scheduled Procedure Step End Date	Yes	No	No
(0040,0005)	Scheduled Procedure Step End Time	Yes	No	No
(0040,0006)	Scheduled Performing Physician Name	Yes	Yes	No
(0040,0007)	Scheduled Procedure Step Description	Yes	Yes	No
(0040,000B)	Scheduled Performing Physician Identification Sequence	Yes	Yes	No
(0040,0010)	Scheduled Station Name	Yes	Yes	No
(0040,0011)	Scheduled Procedure Step Location	Yes	Yes	No
(0040,0012)	Pre-Medication	Yes	Yes	No
(0040,0241)	Performed Station AE Title	Yes	Yes	No
(0040,0242)	Performed Station Name	Yes	Yes	No
(0040,0243)	Performed Location	Yes	Yes	No
(0040,0244)	Performed Procedure Step Start Date	Yes	No	No
(0040,0245)	Performed Procedure Step Start Time	Yes	No	No
(0040,0250)	Performed Procedure Step End Date	Yes	No	No
(0040,0251)	Performed Procedure Step End Time	Yes	No	No
(0040,0253)	Performed Procedure Step ID	Yes	Yes	No
(0040,0254)	Performed Procedure Step Description	Yes	Yes	No
(0040,0275)	Request Attributes Sequence	Yes	Yes	No
(0040,0280)	Comments on Performed Procedure Step	Yes	Yes	No
(0040,0555)	Acquisition Context Sequence	Yes	Yes	No
(0040,1001)	Requested Procedure ID	Yes	Yes	No
(0040,1004)	Patient Transport Arrangements	Yes	Yes	No
(0040,1005)	Requested Procedure Location	Yes	Yes	No
(0040,1010)	Names of Intended Recipient of Results	Yes	Yes	No
(0040,1011)	Intended Recipients of Results Identification Sequence	Yes	Yes	No
(0040,1101)	Person Identification Code Sequence	Yes	Yes	No
(0040,1102)	Person Address	Yes	Yes	No
(0040,1103)	Person Telephone Numbers	Yes	Yes	No
(0040,1400)	Requested Procedure Comments	Yes	Yes	No
(0040,2001)	Reason for Imaging Service Request	Yes	Yes	No
(0040,2008)	Order Entered By	Yes	Yes	No
(0040,2009)	Order Enterer Location	Yes	Yes	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0040,2010)	Order Callback Phone Number	Yes	Yes	No
(0040,2016)	Placer Order Number of Imaging Service Request	Yes	Yes	No
(0040,2017)	Filler Order Number of Imaging Service Request	Yes	Yes	No
(0040,2400)	Imaging Service Request Comments	Yes	Yes	No
(0040,3001)	Confidentiality Constraint on Patient Data Description	Yes	Yes	No
(0040,4005)	Scheduled Procedure Step Start DateTime	Yes	No	No
(0040,4010)	Scheduled Procedure Step Modification DateTime	Yes	No	No
(0040,4011)	Expected Completion Date Time	Yes	No	No
(0040,4023)	Referenced General Purpose Scheduled Procedure Step Transaction UID	Yes	No	No
(0040,4025)	Scheduled Station Name Code Sequence	Yes	Yes	No
(0040,4027)	Scheduled Station Geographic Location Code Sequence	Yes	Yes	No
(0040,4028)	Performed Station Name Code Sequence	Yes	Yes	No
(0040,4030)	Performed Station Geographic Location Code Sequence	Yes	Yes	No
(0040,4034)	Scheduled Human Performers Sequence	Yes	Yes	No
(0040,4035)	Actual Human Performers Sequence	Yes	Yes	No
(0040,4036)	Human Performers Organization	Yes	Yes	No
(0040,4037)	Human Performers Name	Yes	Yes	No
(0040,4050)	Performed Procedure Step Start DateTime	Yes	No	No
(0040,4051)	Performed Procedure Step End DateTime	Yes	No	No
(0040,4052)	Procedure Step Cancellation DateTime	Yes	No	No
(0040,A027)	Verifying Organization	Yes	Yes	No
(0040,A073)	Verifying Observer Sequence	Yes	Yes	No
(0040,A075)	Verifying Observer Name	Yes	Yes	No
(0040,A078)	Author Observer Sequence	Yes	Yes	No
(0040,A07A)	Participant Sequence	Yes	Yes	No
(0040,A07C)	Custodial Organization Sequence	Yes	Yes	No
(0040,A088)	Verifying Observer Identification Code Sequence	Yes	Yes	No
(0040,A123)	Person Name	Yes	Yes	No
(0040,A124)	UID	Yes	Yes	No
(0040,A171)	Observation UID	Yes	Yes	No
(0040,A172)	Referenced Observation UID (Trial)	Yes	Yes	No
(0040,A192)	Observation Date (Trial)	Yes	No	No
(0040,A193)	Observation Time (Trial)	Yes	No	No
(0040,A307)	Current Observer (Trial)	Yes	Yes	No
(0040,A352)	Verbal Source (Trial)	Yes	Yes	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0040,A353)	Address (Trial)	Yes	Yes	No
(0040,A354)	Telephone Number (Trial)	Yes	Yes	Yes
(0040,A358)	Verbal Source Identifier Code Sequence (Trial)	Yes	Yes	No
(0040,A402)	Observation Subject UID (Trial)	Yes	Yes	No
(0040,A730)	Content Sequence	Yes	Yes	No
(0040,DB0C)	Template Extension Organization UID	Yes	Yes	No
(0040,DB0D)	Template Extension Creator UID	Yes	Yes	No
(0070,0001)	Graphic Annotation Sequence	Yes	Yes	No
(0070,0084)	Content Creator's Name	Yes	Yes	No
(0070,0086)	Content Creator's Identification Code Sequence	Yes	Yes	No
(0070,031A)	Fiducial UID	Yes	Yes	No
(0088,0140)	Storage Media Fileset UID	Yes	Yes	No
(0088,0200)	Icon Image Sequence	Yes	Yes	No
(0088,0904)	Topic Title	Yes	Yes	No
(0088,0906)	Topic Subject	Yes	Yes	No
(0088,0910)	Topic Author	Yes	Yes	No
(0088,0912)	Topic Keywords	Yes	Yes	No
(0400,0100)	Digital Signature UID	Yes	Yes	No
(0400,0402)	Referenced Digital Signature Sequence	Yes	Yes	No
(0400,0403)	Referenced SOP Instance MAC Sequence	Yes	Yes	No
(0400,0404)	MAC	Yes	Yes	No
(0400,0550)	Modified Attributes Sequence	Yes	Yes	No
(0400,0561)	Original Attributes Sequence	Yes	Yes	Yes
(2030,0020)	Text String	Yes	Yes	No
(3006,0024)	Referenced Frame of Reference UID	Yes	No	No
(3006,00C2)	Related Frame of Reference UID	Yes	No	No
(3008,0105)	Source Serial Number	Yes	No	No
(300A,0013)	Dose Reference UID	Yes	No	No
(300E,0008)	Reviewer Name	Yes	Yes	No
(4000,0010)	Arbitrary	Yes	Yes	No
(4000,4000)	Text Comments	Yes	Yes	No
(4008,0042)	Results ID Issuer	Yes	Yes	No
(4008,0102)	Interpretation Recorder	Yes	Yes	No
(4008,010A)	Interpretation Transcriber	Yes	Yes	No
(4008,010B)	Interpretation Text	Yes	Yes	No
(4008,010C)	Interpretation Author	Yes	Yes	No
(4008,0111)	Interpretation Approver Sequence	Yes	Yes	No
(4008,0114)	Physician Approving Interpretation	Yes	Yes	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(4008,0115)	Interpretation Diagnosis Description	Yes	Yes	No
(4008,0118)	Results Distribution List Sequence	Yes	Yes	No
(4008,0119)	Distribution Name	Yes	Yes	No
(4008,011A)	Distribution Address	Yes	Yes	No
(4008,0202)	Interpretation ID Issuer	Yes	Yes	No
(4008,0300)	Impressions	Yes	Yes	No
(4008,4000)	Results Comments	Yes	Yes	No
(50xx,xxxx)	Curve Data	Yes	Yes	No
(60xx,0100)	Overlay Bits Allocated	Yes	Yes	No
(60xx,0102)	Overlay Bit Position	Yes	Yes	No
(60xx,3000)	Overlay Data	Yes	Yes	No
(60xx,4000)	Overlay Comments	Yes	Yes	No
(FFFA,FFFA)	Digital Signatures Sequence	Yes	Yes	Yes
(FFFC,FFFC)	Data Set Trailing Padding	Yes	Yes	Yes

Table 94: Application Level Confidentiality Profile Attributes (private tags)

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0019, SIEMENS CT EXAM APP SHARED, 0005)	Multiphase UID	Yes	Yes	Yes
(0019, SIEMENS CT VA0 COAD, 90)	Osteo offset	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 92)	Osteo Regression Line Slope	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 93)	Osteo Regression Line Intercept	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 96)	Osteo Phantom Number	Yes	No	No
(0019, SIEMENS MED NM, 93)	Phase start time	Yes	No	No
(0019, SIEMENS MED NM, A1)	Number of Phases	Yes	No	No
(0019, SIEMENS MED NM, A5)	Number of repeats / phase	Yes	No	No
(0019, SIEMENS MED NM, A6)	Cycles Per Repeat	Yes	No	No
(0019, SIEMENS MED NM, A7)	Repeat Start time	Yes	No	No
(0019, SIEMENS MED NM, A8)	Repeat Stop time	Yes	No	No
(0019, SIEMENS MED NM, A9)	Effective Repeat Time	Yes	No	No
(0019, SIEMENS MED NM, AA)	Acquired Cycles Per Repeat	Yes	No	No
(0033, SIEMENS MED NM, 29)	Crystal Thickness	Yes	No	No
(0033, SIEMENS MED NM, 30)	Preset Name Used for Acquisition	Yes	No	No
(0033, SIEMENS MED NM, 38)	Pixel Scale factor	Yes	No	No
(0035, SIEMENS MED NM, 00)	Specialized TOMO Type	Yes	No	No
(0035, SIEMENS MED NM, 04)	Repeat ID	Yes	No	No
(0035, SIEMENS MED NM, 05)	Phase ID	Yes	No	No
(0041, SIEMENS MED NM, 01)	WholeBody Tomo Position Index	Yes	No	No
(0041, SIEMENS MED NM, 02)	WholeBody Tomo Number of Positions	Yes	No	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0041, SIEMENS MED NM, 10)	Effective Emission Energy	Yes	No	No
(0057, SIEMENS MED NM, 03)	NM Pixel Units	Yes	No	No
(0061, SIEMENS MED NM, 62)	Recon Output Type	Yes	No	No
(0061, SIEMENS MED NM, 70)	NM Reconstruction Algorithm	Yes	No	No
(0061, SIEMENS MED NM, 8D)	QSPECT Flag	Yes	No	No
(0065, SIEMENS MED NM, 01)	Original Detector Index	Yes	No	No
(0065, SIEMENS MED NM, 02)	Siemens Planar Data Organization	Yes	No	No
(7FE3, SIEMENS MED NM, 14)	Minimum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 15)	Maximum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 29)	Number of Rwaves in a frame	Yes	No	No
(0021, SIEMENS MR SDS 01, 19)	MR Phoenix Protocol	Yes	No	No
(0029, SIEMENS CT EXAM IMAGE,49)	Metal Artifact Reduction Type	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 10)	Syngo Report Data	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 11)	Syngo Report Presentation	Yes	No	No
(0029, SIEMENS CSA HEADER, 08)	Modality Image Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 09)	Modality Image Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 10)	Modality Image Header Info	Yes	No	No
(0029, SIEMENS CSA HEADER, 18)	Modality Series Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 19)	Modality Series Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 20)	Modality Series Header Info	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 40)	Application Header Sequence	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 41)	Application Header Type	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 42)	Application Header ID	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 43)	Application Header Version	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 44)	Application Header Info	Yes	No	No
(0029, SIEMENS CT APPL DATASET, 00)	Dual Energy Algorithm Parameters	Yes	No	No
(0029, SIEMENS CT APPL ALG PARAMS, 20)	Perfusion Result Set Id	Yes	No	No
(0029, SIEMENS CSA REPORT, 08)	*syngo* Report Type	Yes	No	No
(0029, SIEMENS CSA REPORT, 09)	*syngo* Report Version	Yes	No	No
(0029, SIEMENS CSA REPORT, 15)	SR Variant	Yes	No	No
(0029, SIEMENS CSA REPORT, 17)	SC SOP Instance UID	Yes	No	No
(0043, GEMS_PARM_01, 1E)	GE Delta Start Time	Yes	No	No
(0049, SIEMENS CT SPP HEADER, 10)	Raw Data Container	Yes	No	No
(0067, SIEMENS MED MI, 02)	Scanner Console Generation	Yes	No	No
(0067, SIEMENS MED MI, 03)	Recon Parameters	Yes	No	No
(0067, SIEMENS MED MI, 05)	Device IVK	Yes	No	No
(0067, SIEMENS MED MI, 14)	Raw Data Description	Yes	No	No
(0067, SIEMENS MED MI, 16)	Raw Data Series Instance UIDs	Yes	No	No
(0067, SIEMENS MED MI, 17)	Raw Data Referenced Series Instance UIDs	Yes	No	No
(0067, SIEMENS MED MI, 18)	Raw Data Blob Sequence	Yes	No	No
(0071, SIEMENS MED PT, 22)	Decay Correction DateTime	Yes	No	No
(0071, SIEMENS MED PT, 23)	Registration Matrix	Yes	No	No

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0071, SIEMENS MED PT, 24)	Table Motion	Yes	No	No
(0071, SIEMENS MED PT, 25)	Lumped Constant	Yes	No	No
(0071, SIEMENS MED PT, 26)	Histogramming Method	Yes	No	No
(0071, SIEMENS MED PT MU MAP, 01)	SOP Class of Source	Yes	No	No
(0071, SIEMENS MED PT MU MAP, 02)	Related Mu Map Series	Yes	No	No

8.3.1.1 Data Minimization for Raw Data

The application treats Raw Data, see chapter 0. The following list of DICOM tags are treated additionally to 8.3.1

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy	Value
(0008,0050)	Accession Number	Yes	Yes	No	Empty
(0008,0090)	Referring Physician's Name	Yes	Yes	Yes	Empty
(0008,103E)	Series Description	Yes	Yes	No	N/A
(0008,1090)	Manufacturer's Model Name	Yes	No	No	N/A
(0010,0010)	Patient's Name	Yes	Yes	Yes	Dummy name
(0010,0030)	Patient's Birth Date	Yes	Yes	Yes	DateTime.Now
(0010,0040)	Patient's Sex	Yes	No	No	O
(0018,1200)	Date of Last Calibration	Yes	Yes	No	N/A
(0018,1201)	Time of Last Calibration	Yes	Yes	No	N/A
(0020,0010)	Study ID	Yes	Yes	Yes	Empty
(0020,000D)	Study Instance UID	Yes	No	No	new ID
(0020,000E)	Series Instance UID	Yes	No	No	New ID

9 Annexes

9.1 IOD Contents

This section specifies each IOD created by this application. It specifies the attribute name, tag, VR, and value. The value specifies the range and source (e.g. user input, Modality Worklist, automatically generated, etc.) For content items in templates, the range and source of the concept name and concept value are specified.

9.1.1 Created SOP Instances

9.1.1.1 CT Image Storage SOP Class

Table 95: IOD of created CT Image SOP Instances

(see also DICOM Standard PS3.3 Section A.3.3 CT Image IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL: Attributes of this module are not present in case of unscheduled patient, or when not delivered by MWL.
Series	General Series	Table 99	ALWAYS
Frame of Reference	Frame of Reference	Table 100	ALWAYS
Equipment	General Equipment	Table 101	ALWAYS
Acquisition	General Acquisition	Table 102	ALWAYS
Image	General Image	Table 103	ALWAYS
	General Reference	Table 104	CONDITIONAL
	Image Plane	Table 105	ALWAYS
	Image Pixel	Table 106	ALWAYS
	Contrast/Bolus	Table 107	CONDITIONAL (If contrast media was used in this image.)
	CT Image	Table 108	ALWAYS
	Multi-energy-CT Image Module	Table 109	CONDITIONAL (If Multi-energy CT Acquisition (0018,9361) is YES) [5]
	Overlay Plane	Table 110	CONDITIONAL
	VOI LUT	Table 111	ALWAYS
	SOP COMMON	Table 112	ALWAYS
	Extension (private)	Table 113	CONDITIONAL

[5] The system provides the option to switch on/off the support of the Supplement 188.

9.1.1.1.1 Patient Module Attributes

Table 96: Patient Module

Attribute	Tag	VR	Value	Presence	Source
Patient´s Name	(0010,0010)	PN		ALWAYS	MWL, USER, AUTO[6]
Patient ID	(0010,0020)	LO		ALWAYS	MWL, USER, AUTO[6]
Issuer of Patient ID	(0010,0021)	LO		ANAP	MWL
Patient´s Birth Date	(0010,0030)	DA		ALWAYS	MWL, USER, AUTO[6]
Patient´s Sex	(0010,0040)	CS	M, F,O	ALWAYS	MWL, USER, AUTO[6]
Patient´s Birth Time	(0010,0032)	TM		ANAP	MWL
Referenced Patient Sequence	(0008,1120)	SQ		ANAP	MWL
>Referenced Patient Sequence SOP Class UID	(0008,1150)	UI		ALWAYS	MWL
>Referenced Patient Sequence SOP Instance UID	(0008,1155)	UI		ALWAYS	MWL

9.1.1.1.2 General Study Module Attributes

Table 97: General Study Module

Attribute	Tag	VR	Value	Presence	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL, AUTO
Study Date	(0008,0020)	DA		ALWAYS	MWL, AUTO
Study Time	(0008,0030)	TM		ALWAYS	MWL, AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	MWL
Study ID	(0020,0010)	SH		ANAP	MWL, AUTO
Accession Number	(0008,0050)	SH		VNAP	MWL, USER, AUTO
Study Description	(0008,1030)	LO		ALWAYS	MWL, AUTO
Referenced Study Sequence	(0008,1110)	SQ		ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
Procedure Code Sequence	(0008,1032)	SQ		ANAP	AUTO
>Code Value	(0008,0100)	SH		ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	AUTO
Requesting Service	(0032,1034)	LO		ANAP	MWL

[6] The value will be generated automatically in case of an unscheduled patient (e.g by using timestamp for patient name)

9.1.1.1.3 Patient Study Module Attributes

Table 98: Patient Study Module

Attribute	Tag	VR	Value	Presence	Source
Admitting Diagnoses Description	(0008,1080)	LO		ANAP	MWL, AUTO
Patient's Age	(0010,1010)	AS		ANAP	MWL, USER, AUTO
Patient's Size	(0010,1020)	DS		ANAP	MWL, USER
Patient`s Weight	(0010,1030)	DS		ANAP	MWL, USER
Medical Alerts	(0010,2000)	LO		ANAP	MWL, USER
Allergies	(0010,2110)	LO		ANAP	MWL, USER
Smoking Status	(0010,21A0)	CS		ANAP	MWL
Additional Patient History	(0010,21B0)	LT		ANAP	MWL
Pregnancy Status	(0010,21C0)	US		ANAP	MWL, USER
Last Menstrual Date	(0010,21D0)	DA		ANAP	MWL
Occupation	(0010,2180)	SH		ANAP	MWL
Admission ID	(0038,0010)	LO		ANAP	MWL, USER, AUTO

9.1.1.1.4 General Series Module Attributes

Table 99: General Series Module – CT Image

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	CT	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI	1.3.12.2.1107.5.1.7.*Device Serial Number.object-identifier*	ALWAYS	AUTO
Series Number	(0020,0011)	IS	e.g. 940 for Ranges	ALWAYS	AUTO
Laterality	(0020,0060)	CS	only available if the body part examined is a paired structure	ANAP	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	e.g. "Radial Ranges", "Parallel Ranges", "Volume Ranges", "Curved Ranges" or from Original	ANAP	USER, COPY
Series Description	(0008,103E)	LO		ANAP	USER, CONFIG
Operators' Name	(0008,1070)	PN		ALWAYS	MWL
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		ANAP	MWL
> Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	MWL
> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	MWL
Body Part Examined	(0018,0015)	CS	BRAIN,HEAD,SKULL,CIRCLEOFWILLIS,IAC, MASTOID,ORBITA,SINUS,MAXILLA, MANDIBLE,NECK,CLAVICLE,SCAPULA, SHOULDER,THORAX,LUNG,MEDIASTINUM, CHEST,HEART,BREAST,ABDOMINALAORTA, ABDOMEN,COLON,KIDNEY,LIVER,PELVIS, SPINE,CTSPINE,CSPINE,TSPINE,TLSPINE, LSPINE,LSSPINE,SSPINE,COCCYX,AORTA, THORACICAORTA,NECKCHEST, NECKCHESTABDOMEN,HEADNECK, NECKCHESTABDPELV,CHESTABDOMEN, CHESTABDPELVIS,ABDOMENPELVIS, PELVISLOWEXTREMT,EXTREMITY, WHOLEBODY,HAND,WRIST,FOREARM, ELBOW,UPPERARM,HUMERUS,UPPERLIMB ,ANKLE,FOOT,KNEE,LOWERLEG,FEMUR, HIP,LOWERLIMB,SPECIAL,PHANTOM	ALWAYS	AUTO
Patient Position	(0018,5100)	CS		ALWAYS	AUTO
Request Attributes Sequence	(0040,0275)	SQ		ANAP	MWL
>Requested Procedure ID	(0040,1001)	SH		ALWAYS	MWL, USER, AUTO
>Accession Number	(0008,0050)	SH		ALWAYS	MWL, USER, AUTO
>Study Instance UID	(0020,000D)	UI		ALWAYS	MWL, USER, AUTO
>Requested Procedure Description	(0032,1060)	LO		ANAP	MWL
>Requested Procedure Code Sequence	(0032,1064)	SQ		ANAP	MWL

Attribute	Tag	VR	Value	Presence	Source
>>Code Value	(0008,0100)	SH		ALWAYS	MWL
>>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	MWL
>>Code Meaning	(0008,0104)	LO		ALWAYS	MWL
>Reason for the Requested Procedure	(0040,1002)	LO		VNAP	MWL
>Requested Procedure Comments	(0040,1400)	LT		VNAP	MWL
>Scheduled Procedure Step Description	(0040,0007)	LO		ANAP	MWL
>Scheduled Procedure Step ID	(0040,0009)	SH		ANAP	MWL
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		ANAP	MWL
>>Code Value	(0008,0100)	SH		ALWAYS	MWL
>>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	MWL
>>Code Meaning	(0008,0104)	LO		ALWAYS	MWL
Performed Procedure Step ID	(0040,0253)	SH		ALWAYS	MWL AUTO
Performed Procedure Step Start Date	(0040,0244)	DA		ALWAYS	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM		ALWAYS	AUTO
Performed Procedure Step Description	(0040,0254)	LO		ANAP	MWL AUTO
Performed Protocol Code Sequence	(0040,0260)	SQ		ANAP	AUTO
>Code Value	(0008,0100)	SH		ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	AUTO

9.1.1.1.5 Frame of Reference Module Attributes

Table 100: Frame of Reference Module

Attribute	Tag	VR	Value	Presence	Source
Frame of Reference UID	(0020,0052)	UI		ALWAYS	AUTO
Position Reference Indicator	(0020,1040)	LO		EMPTY	AUTO

9.1.1.1.6 General Equipment Module Attributes

Table 101: General Equipment Module

Attribute	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO	“Siemens Healthineers”	ALWAYS	FIXED
Institution Name	(0008,0080)	LO	from WS Configuration	ALWAYS	CONFIG
Institution Address	(0008,0081)	ST	from WS Configuration	ALWAYS	CONFIG
Station Name	(0008,1010)	SH	from WS Configuration	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	LO	from WS Configuration	ALWAYS	CONFIG
Manufacturer's Model Name	(0008,1090)		SOMATOM go.Now, SOMATOM go.Now Rise, SOMATOM go.Now Wise, SOMATOM go.Up, SOMATOM go.Up Rise, SOMATOM go.All, SOMATOM go.All Rise, SOMATOM go.Top, SOMATOM go.Top Rise, SOMATOM go.Top Wise, SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM Pro.Pulse, SOMATOM Pro.Pulse Velo, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha, SOMATOM On.Site, Syngo Application SW_SYS	ALWAYS	FIXED
Device Serial Number	(0018,1000)	LO		ALWAYS	FIXED
Software Versions	(0018,1020)	LO	syngo CT VB10A	ALWAYS	FIXED
Gantry ID	(0018,1008)	LO		ANAP	CONFIG
Spatial Resolution	(0018,1050)	DS		ANAP	FIXED
Date of Last Calibration	(0018,1200)	DA		ANAP	AUTO
Time of Last Calibration	(0018,1201)	TM		ANAP	AUTO

9.1.1.1.7 General Acquisition Module Attributes

Table 102: General Acquisition Module

Attribute	Tag	VR	Value	Presence	Source
Acquisition Number	(0020,0012)	IS		ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Acquisition DateTime	(0008,002A)	DT		ALWAYS	AUTO
Irradiation Event UID	(0008,3010)	UI		ALWAYS	AUTO

9.1.1.1.8 General Image Module Attributes

Table 103: General Image Module

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS	0 for reference image	ALWAYS	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Image Type	(0008,0008)	CS	See Image Type Values 9.1.1.1.13.1, 9.1.1.1.13.2	ALWAYS	AUTO
Image Comments	(0020,4000)	LT	e.g."Automatic Result, ME_70keV,Score9999,HD FoV,Artificial120, eDDensity" "60bpm, 75%, 400ms, TS" "Filter Sn" *Note:* ***Artificial120****: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum.* ***eDDensity****: Image values are proportional to electron density. (Electron density variant of DirectDensity)*	ALWAYS	USER, AUTO
Burned in Annotation	(0028,0301)	CS	NO	ALWAYS	FIXED
Lossy Image Compression	(0028,2110)	CS	00 = uncompressed 01 = compressed	ALWAYS	FIXED
Irradiation Event UID	(0008,3010)	UI		ALWAYS	AUTO
Real World Value Mapping Sequence	(0040,9096)	SQ		ALWAYS	AUTO
> LUT Explanation	(0028,3003)	LO	Monoenergetic Plus, Virtual Unenhanced, Calcium Removed image, Iodine Removed image, Mixed, Low Energy Image, High Energy Image, Threshold 1 Image,	ALWAYS	AUTO
> LUT Label	(0040,9210)	LO	See Image Type Values 9.1.1.1.13.2 Value 4	ALWAYS	AUTO
> Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>> Code Value	(0008,0100)	SH	mg/cm3, [hnsf'U]	ANAP	AUTO
>> Code Scheme Designator	(0008,0102)	SH	UCUM	ANAP	AUTO
>>Code Meaning	(0008,0104)	SH	mg/cm^3, Hounsfield Unit	ANAP	AUTO
> Quantity Definition Sequence	(0040,9220)	SQ		ANAP	AUTO

Attribute	Tag	VR	Value	Presence	Source
>> Concept Name Code Sequence	(0040,A043)	SQ		ANAP	AUTO
>>> Code Value	(0008,0100)	SH	105590001	ANAP	AUTO
>>> Code Scheme Designator	(0008,0102)	SH	SCT	ANAP	AUTO
>>>Code Meaning	(0008,0104)	SH	Substance	ANAP	AUTO
>> Concept Code Sequence	(0040,A168)	SQ		ANAP	AUTO
>>> Code Value	(0008,0100)	SH	11713004, 44588005, 5540006	ANAP	AUTO
>> Code Scheme Designator	(0008,0102)	SH	SCT	ANAP	AUTO
>>>Code Meaning	(0008,0104)	SH	Water, Iodine, Calcium	ANAP	AUTO
>Real World Value First Value Mapped	(0040,9216)	US	0	ANAP	AUTO
>Real World Value Last Value Mapped	(0040,9211)	US	65535	ANAP	AUTO
> Real World Value Intercept	(0040,9224)	FD	-8192, -8192	ALWAYS	AUTO
> Real World Value Slope	(0040,9225)	FD	0.1,1.0	ALWAYS	AUTO
> Real World Value Last Value Mapped	(0040,9225)	FD	0.1,1.0	ALWAYS	AUTO

9.1.1.1.9 General Reference Module Attributes

Table 104: General Reference Module

Attribute	Tag	VR	Value	Presence	Source
Referenced Image Sequence	(0008,1140)	SQ	Reference to LOCALIZER / not present for LOCALIZER	ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008, 1155)	UI		ALWAYS	AUTO
Source Image Sequence	(0008,2112)	SQ	If derived from single image	ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO

9.1.1.1.10 Image Plane Module Attributes

Table 105: Image Plane Module

Attribute	Tag	VR	Value	Presence	Source
Pixel Spacing	(0028,0030)	DS		ALWAYS	AUTO
Image Orientation (Patient)	(0020,0037)	DS		ALWAYS	AUTO
Image Position (Patient)	(0020,0032)	DS		ALWAYS	AUTO
Slice Thickness	(0018,0050)	DS		ALWAYS	AUTO
Slice Location	(0020,1041)	DS		ALWAYS	AUTO

9.1.1.1.11 Image Pixel Module Attributes

Please refer to Table 108: CT Image Module for attributes of "Image Pixel Module" which are specialized in "CT Image Module".

Table 106: Image Pixel Module

Attribute	Tag	VR	Value	Presence	Source
Rows	(0028,0010)	US		ALWAYS	AUTO
Columns	(0028,0011)	US		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	FIXED
Pixel Data	(7FE0,0010)	OB		ALWAYS	AUTO
Smallest Image Pixel Value	(0028,0106)	US		ALWAYS	AUTO
Largest Image Pixel Value	(0028,0107)	US		ALWAYS	AUTO

9.1.1.1.12 Contrast/Bolus Module Attributes

Table 107: Contrast Bolus Module

Attribute	Tag	VR	Value	Presence	Source
Contrast/Bolus Agent	(0018,0010)	LO	Type of used Contrast medium	VNAP	AUTO
Contrast/Bolus Volume	(0018,1041)	DS		ALWAYS	AUTO
Contrast/Bolus Start Time	(0018,1042)	TM		ALWAYS	AUTO
Contrast/Bolus Stop Time	(0018,1043)	TM		ALWAYS	AUTO
Contrast/Bolus Total Dose	(0018,1044)	DS	NOTE: Total amount in [mL] of the undiluted contrast agent – EXCLUDING Saline	ALWAYS	AUTO
Contrast Flow Rate	(0018,1046)	DS	Note: Multiple entries are possible (e.g. in case of e.g. multiphase injection protocols), Unit [mL/s]	ALWAYS	AUTO
Contrast Flow Duration	(0018,1047)	DS	Note: Multiple entries are possible (e.g. in case e.g. multiphase injection protocols), Unit: [s]	ALWAYS	AUTO
Contrast/Bolus Ingredient	(0018,1048)	CS	IODINE	ALWAYS	FIXED
Contrast/Bolus Ingredient Concentration	(0018,1049)	DS	Note: [mg] of active ingredient per [mL] of (diluted) agent	ALWAYS	AUTO

9.1.1.1.13 CT Image Module Attributes

Table 108: CT Image Module

Attribute	Tag	VR	Value	Presence	Source
Image Type	(0008,0008)	CS	See Image Type Values 9.1.1.1.13.1, 9.1.1.1.13.2	ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	1	ALWAYS	FIXED
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	FIXED
Bits Allocated	(0028,0100)	US	16	ALWAYS	FIXED
Bits Stored	(0028,0101)	US	16	ALWAYS	FIXED
High Bit	(0028,0102)	US	15	ALWAYS	FIXED
Rescale Intercept	(0028,1052)	DS	-8192	ALWAYS	AUTO
Rescale Slope	(0028,1053)	DS	1	ALWAYS	AUTO
Rescale Type	(0028,1054)	LO	See Rescale Type Values 9.1.1.1.13.3,9.1.1.1.13.4	ALWAYS	AUTO
KVP	(0018,0060)	DS	Empty if KVP is available in (0018,9362)	VNAP	AUTO
Acquisition Number	(0020,0012)	IS		ALWAYS	AUTO
Scan Options	(0018,0022)	CS	Contains cardiac or respiratory information, from Original - if original is a CT image, not set in case original is an XR3D or Enhanced CT image	ANAP	COPY
Data Collection Diameter	(0018,0090)	DS		ALWAYS	AUTO
Reconstruction Diameter	(0018,1100)	DS		ALWAYS	AUTO
Distance Source to Detector	(0018,1110)	DS		ALWAYS	AUTO
Distance Source to Patient	(0018,1111)	DS		ALWAYS	AUTO
Gantry/Detector Tilt	(0018,1120)	DS		ALWAYS	AUTO
Table Height	(0018,1130)	DS		ALWAYS	AUTO
Rotation Direction	(0018,1140)	CS		ANAP	AUTO
Exposure Time	(0018,1150)	IS		ALWAYS	AUTO
X-Ray Tube Current	(0018,1151)	IS		ALWAYS	AUTO
Exposure	(0018,1152)	IS	Product of X-Ray Tube Current and Exposure Time. Unit is [mAs].	ALWAYS	AUTO
Filter Type	(0018,1160)	SH	„SN_DE“, „SN_DESF“, „AU_DESF“, „AUSN_DESF“, „SN_LD“, „W1“, „W1 SN_LD“,„W12“	ALWAYS	AUTO
Generator Power	(0018,1170)	IS		ALWAYS	AUTO
Focal Spot(s)	(0018,1190)	DS		ALWAYS	AUTO
Convolution Kernel	(0018,1210)	SH	e.g. „Sa“, „Sd“ *Note : Sd for eDDensity, Sa for Artifical120* *Note :* *Artifical120 : The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum.* *eDDensity : image values are proportional to electron density. (Electron density variant of DirectDensity)*	ALWAYS	AUTO
Single Collimation Width	(0018,9306)	FD		ALWAYS	AUTO

Attribute	Tag	VR	Value	Presence	Source
Total Collimation Width	(0018,9307)	FD		ALWAYS	AUTO
Table Speed	(0018,9309)	FD		ANAP	AUTO
Table Feed per Rotation	(0018,9310)	FD		ANAP	AUTO
Spiral Pitch Factor	(0018,9311)	FD		ANAP	AUTO
Exposure Modulation Type	(0018,9323)	CS	OFF_OFF, OFF_OFF_MINDO, OFF_OFF_PULS, OFF_MAC, OFF_MAC_MINDO, OFF_MAC_PULS, OFF_ZEC, OFF_ZEC_MINDO, OFF_ZEC_PULS, SHAPE_OFF, SHAPE_OFF_MINDO, SHAPE_OFF_PULS, SHAPE_MAC, SHAPE_MAC_MINDO, SHAPE_MAC_PULS, SHAPE_ZEC, SHAPE_ZEC_MINDO, SHAPE_ZEC_PULS, SINOD_OFF, SINOD_OFF_MINDO, SINOD_OFF_PULS, SINOD_MAC, SINOD_MAC_MINDO, SINOD_MAC_PULS, SINOD_ZEC, SINOD_ZEC_MINDO, SINOD_ZEC_PULS, ELLIP_OFF, ELLIP_OFF_MINDO, ELLIP_OFF_PULS, ELLIP_MAC, ELLIP_MAC_MINDO, ELLIP_MAC_PULS, ELLIP_ZEC, ELLIP_ZEC_MINDO, ELLIP_ZEC_PULS, XCARE_OFF, XCARE_OFF_MINDO, XCARE_OFF_PULS, XCARE_MAC, XCARE_MAC_MINDO, XCARE_MAC_PULS, XCARE_ZEC,XCARE_ZEC_MINDO, XCARE_ZEC_PULS	ALWAYS	AUTO
CTDIvol	(0018,9345)	FD		ANAP	AUTO
CTDI Phantom Type Code Sequence	(0018,9346)	SQ	Not present if Multi-energy CT Acquisition (0018,9361) is YES [7]	ANAP	FIXED
>Code Value	(0008,0100)	SH	"113691"	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	“DCM”	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	"IEC Body Dosimetry Phantom"	ALWAYS	FIXED
Calcium Scoring Mass Factor Device Attribute	(0018,9352)	FL	e.g. W1 SN_LD	ANAP	FIXED
Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO

Attribute	Tag	VR	Value	Presence	Source
CT Additional X-Ray Source Sequence	(0018,9360)	SQ	Not present if Multi-energy CT Acquisition (0018,9361) is YES [7]	ANAP	AUTO
>Focal Spot(s)	(0018,1190)	DS		ANAP	AUTO
>Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO
Multi-energy CT Acquisition	(0018,9361)	CS	YES NO	ANAP	CONFIG

9.1.1.1.13.1 Image Type Values

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  - ORIGINAL: Identifies an Original Image
  - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - PRIMARY: Identifies a Primary Image
  - SECONDARY: Identifies a Secondary Image
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:
  - AXIAL: identifies a CT cross-sectional image
  - LOCALIZER: identifies a CT Localizer Image
  - OTHER: Converted non-Axial and non-Localizer CT images
    Note: AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
  - CT_SOM5 RTD: identifies a Real Time Display Image
  - CT_SOM5 MIP: identifies a Maximum Intensity Projection image created by a CT application of a non-fix-axial Spiral Range
  - CT_SOM5 MPR: identifies Multi Planar Reconstruction image created by a CT application of non-fix-axial Spiral range
  - CT_SOM5 MON: identifies an image of a Monitoring or Premonitoring range
  - CT_SOM5 ROT: identifies an image of a ROT range
  - CT_SOM5 SEQ: identifies an image of a Sequence range
  - CT_SOM5 SPI: identifies an image of a fix-axial Spiral range
  - CT_SOM5 STA: identifies an image of a Static range
  - CT_SOM5 TOP: identifies an image of a Topogram range
  - CT_SOM8 DESPR: identifies Stopping Power Ratio (SPR) images
  - CT_SOM8 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
  - CT_SOM10 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
  - CT_SOM10 DEMIX: identifies mixed reconstructions out of two energy spectra
  - CT_SOM10 DEVNC: identifies VNC or Iodine reconstructions out of two energy spectra
  - 4D SPI: identifies an image of a ZigZag range
  - CSA BLACK IMAGE: identifies an SC Image with black pixels; only graphics information is of interest
  - CT_SOM PROT: identifies an SC Image with black pixels; only graphics information is of interest
  - FLU: identifies an image of a fluoroscopy range
  - CT_SOM_ECGDOC: identifies an ECG documentation image
  - MPR: identifies Multi Planar Reconstruction image
  - MIP: identifies Maximum Intensity Projection image
  - MINIP: identifies Minimum Intensity Projection
  - SYNCT_HEAD: identifies Synthetic CT image (Head)
  - SYNCT_PELVIS: identifies Synthetic CT image (Pelvis)

[7] The system provides the option to switch on/off the support of the Supplement 188.

- Value 5 is specific to the syngo CT VB10A products
  - STD: Standard image of corresponding Type as given in value 4.
  - OTOM: Osteo Scanned Tomogram
  - OTOP: Osteo Scanned Topogram
  - PMON: Premonitoring Scan
  - TBOL: Testbolus Scan
  - RECON REFERENCE: identifies an image containing overlay graphics indicating the location of recon slices.
  - RANGE REFERENCE: identifies an image containing overlay graphics indicating the area of a scan range.
  - ME<energy>KEV: Mono-Energetic Image
  - VNC: Virtual Non-Contrast Image
  - IOD: Iodine Enhancement Image
  - IMD: Iodine Concentration Image
  - MIX: mixed reconstructions out of two energy spectra
  - L: Image out of low energy
  - H: Image out of high energy
  - PARALLEL: Range type for parallel ranges (for syngo application)
  - RADIAL: Range type for radial ranges (for syngo application)
  - CURVED: Range type for radial ranges (for syngo application)
  - SPR: identifies Stopping Power Ratio (SPR) images
- Value 6 is specific to dual energy acquisitions. The following terms are defined:
  - DE_TB: split filter dual energy range.
  - DE_2SPI: dual spiral dual energy range.
  - DE_2SRC: dual source dual energy range
  - SNRG: Single energy
- Value 7 is specific to reconstruction of dual energy acquisitions. The following terms are defined:
  - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
  - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction
  - CONVCT: Conventional CT image

9.1.1.1.13.2 Image Type Values for Multi-Energy (Supplement 188)

- Value 4 identifies a Multi-Energy CT Image and is added after Value 3 of a Single-Energy CT Image. It is only present if Multi-energy CT Acquisition (0018,9361) has a value of YES [8](except for NAEOTOM Alpha where Value 4 is always added) (see also Value 4 of Single-Energy CT Images in 9.1.1.1.13.1)
  - VMI identifies a Virtual Monoenergetic Image
  - MAT_SPECIFIC identifies a Material-Specific Image
  - MAT_REMOVED identifies a Material-Removed Image
  - THRESHOLD: identifies image at a specific energy threshold (see note below)
  - ENERGY_PROP_WT: identifies fused image out of two energy spectra
  - LOW: identifies low energetic images
  - HIGH: identifies high energetic images
- Value 5 is implementation specific (see also Value 4 of Single-Energy CT Images in 9.1.1.1.13.1)
  - CT_SOM10 DET3D: Threshold image
  - CT_SOM10 DEVNI: identifies VNI or Non-Iodine reconstructions out of two energy spectra
  - CT_SOM10 DEVCR: Vascular Calcium Removal image
  - CT_SOM10 DEQUAD: Quadruple
- Value 6 is implementation specific
  - ME<energy>KEV: Mono-Energetic Image
  - T1
  - PMON: Premonitoring Scan
  - MON:Monitoring Scan

[8] The system provides the option to switch on/off the support of the Supplement 188. The option has not to be switched off.

    - VNC: Virtual Non-Contrast Image
    - IOD: Iodine Enhancement Image
    - IMD: Iodine Concentration Image
    - VCR<energy>KEV
    - VNI<energy>KEV
    - L: Image out of low energy
    - H: Image out of high energy
- Value 7
    - COUNT: Single Source Counting
    - COUNT_2SRC: Dual Source Counting
    - COUNT_2KVP
- Value 8
    - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
    - CONVCT: Conventional CT image
    - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction
    - SPP: Spectral Post-Processing data is included
- Value 9 (only if Value 8 is CONVCT)
    - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction

Note: THRESHOLD images are reconstructed from all photons registered at the detector above a certain energy threshold, e.g. above 25keV. The actual thresholds are denoted as T1, T2, ..., with T1 being the lowest threshold.

In particular, THRESHOLD images reconstructed from the lowest threshold T1 use all photons detected at the detector.

Such images are also denoted as T3D images.

For some scan modes and reconstructions, e.g. UHR modes with sharp kernels, T3D images are the only available images.

9.1.1.1.13.3 Rescale Type Values

- HU used for Hounsfield Units
- Z_EFF used for Effective Atomic Number
- ED used for Electron Density
- EDW used for normalized Electron Density
- 100ug/cm3 used for Iodine Concentration images
- US used for LOCALIZER images

9.1.1.1.13.4 Rescale Type Values for Multi-Energy (Supplement 188)

- MGML used for Material density
- HU_MOD used for Modified Hounsfield Unit

9.1.1.1.14 Multi-energy CT Image Module

The Multi-energy CT Image Module is only present if Multi-energy CT Acquisition (0018,9361) has a value of YES. The system provides the option to switch on/off the support of the Supplement 188.

Table 109: Multi-energy CT Image Module

Attribute	Tag	VR	Value	Presence	Source
Multi-energy CT Acquisition Sequence	(0018,9362)	SQ		ALWAYS	AUTO
>Multi-energy Acquisition Description	(0018,937B)	UT	TWINBEAM, DUAL SPIRAL, COUNTING, DUAL SOURCE	ALWAYS	AUTO
>Multi-energy CT X-Ray Source Sequence	(0018,9365)	SQ		ALWAYS	AUTO
>>X-Ray Source Index	(0018,9366)	US		ALWAYS	AUTO
>>X-Ray Source ID	(0018,9367)	UC		ALWAYS	AUTO
>>Multi-energy Source Technique	(0018,9368)	CS	CONSTANT_SOURCE	ALWAYS	FIXED
>>Source Start DateTime	(0018,9369)	DT		ALWAYS	AUTO
>>Source End DateTime	(0018,936A)	DT		ALWAYS	AUTO
>>Generator Power	(0018,1170)	IS		ALWAYS	AUTO
>CT Exposure Sequence	(0018,9321)	SQ		ALWAYS	AUTO
>>Referenced X-Ray Source Index	(0018,9377)	US		ALWAYS	AUTO
>>Estimated Dose Saving [9]	(0018,9324)	FD		ALWAYS	EMPTY
>>Exposure Time in ms	(0018,9328)	FD		ALWAYS	AUTO
>>X-Ray Tube Current in mA	(0018,9330)	FD		ALWAYS	AUTO
>>Exposure in mAs	(0018,9332)	FD		ALWAYS	AUTO
>> Exposure Modulation Type	(0018,9323)	CS	ELLIP_ZEC (longitudinal and angular modulation)	ALWAYS	AUTO
>>CTDIvol	(0018,9345)	FD		ALWAYS	AUTO
>> CTDI Phantom Type Code Sequence	(0018,9346)	SQ		ALWAYS	AUTO
>>> Code Value	(0008,0100)	SH	“113691”	ALWAYS	FIXED
>>> Coding Scheme Designator	(0008,0102)	SH	“DCM”	ALWAYS	FIXED
>>> Code Meaning	(0008,0104)	LO	“IEC Body Dosimetry Phantom”	ALWAYS	FIXED
>Multi-energy CT X-Ray Detector Sequence	(0018,936F)	SQ		ALWAYS	AUTO
>> X-Ray Detector Index	(0018,9370)	US		ALWAYS	AUTO
>> X-Ray Detector ID	(0018,9371)	UC		ALWAYS	AUTO
>> Multi-energy Detector Type	(0018,9372)	CS	“INTEGRATING” “PHOTON_COUNTING”	ALWAYS	AUTO
>> Nominal Max Energy	(0018,9374)	DS		ANAP	AUTO

[9] This attribute is retired in the DICOM standard (2020a). It may be dropped from our implementation in future versions of this software without further notice.

Attribute	Tag	VR	Value	Presence	Source
>> Nominal Min Energy	(0018,9375)	DS		ANAP	AUTO
>Multi-energy CT Path Sequence	(0018,9379)	SQ		ALWAYS	AUTO
>> Multi-energy CT Path Index	(0018,937A)	US		ALWAYS	AUTO
>> Referenced X-Ray Source Index	(0018,9377)	US		ALWAYS	AUTO
>>Referenced X-Ray Detector Index	(0018,9376)	US		ALWAYS	AUTO
>CT Acquisition Details Sequence	(0018,9304)	SQ		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> Rotation Direction	(0018,1140)	CS	“CW”	ALWAYS	FIXED
>> Revolution Time	(0018,9305)	FD		ALWAYS	AUTO
>> Single Collimation Width	(0018,9306)	FD		ALWAYS	AUTO
>> Total Collimation Width	(0018,9307)	FD		ALWAYS	AUTO
>> Table Height	(0018,1130)	DS		ALWAYS	AUTO
>> Gantry/Detector Tilt	(0018,1120)	DS		ALWAYS	AUTO
>> Data Collection Diameter	(0018,0090)	DS		ALWAYS	AUTO
> CT X-Ray Details Sequence	(0018,9325)	SQ		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> KVP	(0018,0060)	DS		ALWAYS	AUTO
>>Filter Type	(0018,1160)	SH	“W1”, “W1 SN_LD”, “W1 SN_DE”, “W1 AU_DESF”, “W1 SN_DESF”, “W12”	ALWAYS	AUTO
>>Focal Spot(s)	(0018,1190)	DS		ANAP	AUTO
>> Filter Material	(0018,7050)	CS	“ALUMINUM” “MIXED”	ALWAYS	AUTO
>>Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO
> CT Geometry Sequence	(0018,9312)	SQ		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> Distance Source to Detector	(0018,1110)	DS		ALWAYS	AUTO
>> Distance Source to Data Collection Center	(0018,9335)	FD		ALWAYS	AUTO
Multi-energy CT Processing Sequence	(0018,9363)	SQ		ANAP	AUTO
> Decomposition Method	(0018,937E)	CS	“PROJECTION_BASED” “IMAGE_BASED” “HYBRID”	ALWAYS	AUTO
> Decomposition Description	(0018,937F)	UT	“None” “Iodine/Water” “Calcium/Iodine”	ALWAYS	AUTO
Multi-energy CT Characteristics Sequence	(0018,9364)	SQ		ANAP	AUTO
> Monoenergetic Energy Equivalent	(0018,937C)	FD		ALWAYS	AUTO

Attribute	Tag	VR	Value	Presence	Source
> Derivation Algorithm Sequence	(0022,1612)	SQ		ALWAYS	AUTO
>> Algorithm Family Code Sequence	(0066,002F)	SQ		ALWAYS	AUTO
>>> Code Value	(0008,0100)	SH	"123108"	ALWAYS	FIXED
>>> Coding Scheme Designator	(0008,0102)	SH	“DCM”	ALWAYS	FIXED
>>> Code Meaning	(0008,0104)	LO	"Multispectral Processing"	ALWAYS	FIXED
>>Algorithm Name	(0066,0036)	LO	“Monoenergetic Plus” “Virtual Unenhanced” “Vascular Calcium Removal” “Virtual Non Iodine”	ALWAYS	AUTO
>>Algorithm Version	(0066,0031)	LO	“VB10A”	ANAP	FIXED
>>Algorithm Source	(0024,0202)	LO	“Siemens Healthineers”	ALWAYS	FIXED
> Performed Processing Parameters Sequence	(0074,1212)	SQ		ALWAYS	AUTO
>> Value Type	(0040, A040)	CS	“TEXT”	ALWAYS	AUTO
>> Concept Name Code Sequence	(0040, A043)	SQ		ALWAYS	AUTO
>>> Coding Scheme Designator	(0008,0102)	SH	“DCM”	ALWAYS	FIXED
>>> Code Value	(0008,0100)	SH	“123108”	ALWAYS	FIXED
>>> Code Meaning	(0008,0104)		“Multispectral Processing”	ALWAYS	FIXED
>> Text Value	(0040, A160)	UT	“not provided”	ANAP	AUTO

9.1.1.1.15 Overlay Plane Module Attributes

Table 110: Overlay Plane Module

Attribute	Tag	VR	Value	Presence	Source
Overlay Rows	(60xx,0010)	US		ALWAYS	AUTO
Overlay Columns	(60xx,0011)	US		ALWAYS	AUTO
Overlay Type	(60xx,0040)	CS		ALWAYS	AUTO
Overlay Origin	(60xx,0050)	SS		ALWAYS	AUTO
Overlay Bits Allocated	(60xx,0100)	US	1	ALWAYS	FIXED
Overlay Bit Position	(60xx,0102)	US	0	ALWAYS	FIXED
Overlay Data	(60xx,3000)	OB		ALWAYS	AUTO
Overlay Description	(60xx,0022)	LO		VNAP	FIXED
Overlay Subtype	(60xx,0045)	LO	AUTOMATED	ALWAYS	FIXED
Overlay Label	(60xx,1500)	LO		ALWAYS	FIXED

9.1.1.1.16 VOI LUT Module Attributes

Table 111: VOI LUT Module

Attribute	Tag	VR	Value	Presence	Source
Window Center	(0028,1050)	DS		ALWAYS	AUTO
Window Width	(0028,1051)	DS		ALWAYS	AUTO
Window Center & Width Explanation	(0028,1055)	LO		ALWAYS	AUTO
VOI LUT Sequence	(0028,3010)	SQ	from Original	ANAP	COPY

9.1.1.1.17 SOP Common Module Attributes

Table 112: SOP Common Module

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	“1.3.12.2.1107.5.1.7." + serial number +part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG
Timezone Offset From UTC	(0008,0201)	SH		ANAP	AUTO

9.1.1.1.18 Extension

Table 113: Extension Module

Attribute	Tag	VR	Value	Presence	Source
Other Patient IDs	(0010,1000)	LO		ANAP	MWL, AUTO
Other Patient Names	(0010,1001)	PN		ANAP	MWL, AUTO

9.1.1.2 Raw Data Storage SOP Class

Note: Raw Data Storage SOP Class is only used internally and is not exposed externally. The Raw Data is stored and handled in a proprietary format.

Table 114: IOD of created Raw Data SOP Instances

(see also DICOM Standard PS3.3 Section A.37.3 Raw Data IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL
Series	General Series	Table 99	ALWAYS
Frame of Reference	Frame of Reference	Table 100	ALWAYS
Equipment	General Equipment	Table 101	ALWAYS
Raw Data	Acquisition Context	Table 116	ALWAYS
	Raw Data	Table 117	ALWAYS
	SOP Common	Table 118	ALWAYS

9.1.1.2.1 General Series Module Attributes – Raw Data

Table 115: General Series Module – Raw Data

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	CT	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO		ANAP	USER

9.1.1.2.2 Acquisition Context Module Attributes – Raw Data

Table 116: Acquisition Context Module – Raw Data

Attribute	Tag	VR	Value	Presence	Source
Acquisition Context Sequence	(0040,0555)	SQ		EMPTY	AUTO

9.1.1.2.3 Raw Data Module Attributes

Table 117: Raw Data Module

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS		VNAP	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO

Attribute	Tag	VR	Value	Presence	Source
Creator-Version UID	(0008,9123)	UI		ALWAYS	AUTO

9.1.1.2.4 SOP Common Module Attributes – Raw Data

Table 118: SOP Common Module – Raw Data

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.66	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG
Timezone Offset From UTC	(0008,0201)	SH		ANAP	AUTO

9.1.1.3 Secondary Capture Image Storage SOP Class

Table 119: IOD of created Secondary Capture Image SOP Instances

(see also DICOM Standard PS3.3 Section A.8.3 Secondary Capture Image IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL
Series	General Series	Table 120	ALWAYS
General Reference	General Reference	Table 121	ALWAYS
Equipment	General Equipment	Table 122	CONDITIONAL
	SC Equipment	Table 123	ALWAYS
Image	General Image	Table 124	ALWAYS
	Image Pixel	Table 125	ALWAYS
	SC Image	Table 126	CONDITIONAL
	Overlay Plane	Table 127	CONDITIONAL
	SOP Common	Table 128	ALWAYS

9.1.1.3.1 General Series Module Attributes – Secondary Capture Image

Table 120: General Series Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	OT or XA or CT (default = OT, can be configured) (Captured Projection Image) XA (Bookmarks)	ALWAYS	AUTO, CONFIG
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS	e.g. 940 for Ranges, 970 for all other Captured Projection objects (Captured Projection Image) 980 (Bookmarks)	ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	“Radial Ranges”, “Parallel Ranges”, “Volume Ranges”, “Curved Ranges” or from Original, Bookmark	ANAP	USER, COPY
Series Description	(0008,103E)	LO	e.g. “eDDensity, Artifical120” Note: Artificial120: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum. eDDensity: Image values are proportional to electron density. (Electron density variant of DirectDensity)	ANAP	USER

9.1.1.3.2 General Reference Module Attributes – Secondary Capture Image

Table 121: General Reference Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Referenced Image Sequence	(0008,1140)	SQ	Reference to LOCALIZER / not present for LOCALIZER	ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008, 1155)	UI		ALWAYS	AUTO
Derivation Description	(0008,2111)	ST	“Secondary Capture”	ANAP	AUTO
Derivation Code Sequence	(0008,9215)	SQ		ANAP	AUTO
>>Code Value	(0008,0100)	SH	"1113074"	ALWAYS	MWL
>>Coding Scheme Designator	(0008,0102)	SH	“DCM”	ALWAYS	MWL
>>Code Meaning	(0008,0104)	LO	"Volume Rendering"	ALWAYS	MWL
Source Image Sequence	(0008,2112)	SQ	If derived from single image	ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO

9.1.1.3.3 General Equipment Module Attributes – Secondary Capture Image

Table 122: General Equipment Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO	"Siemens Healthineers"	ALWAYS	FIXED
Institution Name	(0008,0080)	LO	from WS Configuration	ALWAYS	CONFIG
Institution Address	(0008,0081)	ST	from WS Configuration	ALWAYS	CONFIG
Station Name	(0008,1010)	SH	from WS Configuration	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	LO	from WS Configuration	ALWAYS	CONFIG
Manufacturer's Model Name	(0008,1090)		SOMATOM go.Now, SOMATOM go.Now Rise, SOMATOM go.Now Wise, SOMATOM go.Up, SOMATOM go.Up Rise, SOMATOM go.All, SOMATOM go.All Rise, SOMATOM go.Top, SOMATOM go.Top Rise, SOMATOM go.Top Wise, SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM Pro.Pulse, SOMATOM Pro.Pulse Velo, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha, SOMATOM On.Site, Syngo Application SW_SYS	ALWAYS	FIXED
Device Serial Number	(0018,1000)	LO		ALWAYS	FIXED
Software Versions	(0018,1020)	LO	syngo CT VB10A	ALWAYS	FIXED
Spatial Resolution	(0018,1050)	DS		ALWAYS	AUTO
Pixel Padding Value	(0028,0120)	US	"0" for MONOCHROME2	ANAP	AUTO

9.1.1.3.4 SC Equipment Module Attributes

Table 123: SC Equipment Module

Attribute	Tag	VR	Value	Presence	Source
Conversion Type	(0008,0064)	CS	"WSD"	ALWAYS	FIXED
Modality	(0008,0060)	CS	OT or XA or CT (default = OT, can be configured) (Captured Projection Image) XA (Bookmarks)	ALWAYS	AUTO, CONFIG
Secondary Capture Device ID	(0018,1010)	LO		ANAP	AUTO
Secondary Capture Device Manufacturer	(0018,1016)	LO	"Siemens Healthineers"	ALWAYS	COPY
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO	See Manufacturers Model Name, not present for patient protocol	ANAP	COPY
Secondary Capture Device Software Versions	(0018,1019)	LO	from WS Configuration	ALWAYS	CONFIG

9.1.1.3.5 General Image Module Attributes – Secondary Capture Image

Table 124: General Image Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS	From original (derived from single image) or calculated or <zero length> (Derived from multiple images)	ALWAYS	COPY, AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Image Type	(0008,0008)	CS	See Image Type Values 0	ALWAYS	AUTO
Image Comments	(0020,4000)	LT	Description, i.e. "Automatic Result" , "ME 70keV/FAT" , "FatMap" "Automatic Result ", "VNC/IOD" , "Virtual Unenhanced "	ANAP	AUTO, USER
Burned in Annotation	(0028,0301)	CS	"NO"	ALWAYS	AUTO
Lossy Image Compression	(0028,2110)	CS	"00 = uncompressed 01 = compressed	ALWAYS	AUTO

9.1.1.3.5.1 Image Type Values of Captures Projection Images

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - SECONDARY: Identifies a Secondary Image
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:
  - OTHER: Converted non-Axial and non-Localizer CT images
  - AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
  - IAE_PRJ
  - MPR_FUSION
  - CT_SOM PROT (in case of patient protocol)
  - CT_SOM 3DCAM (in case of 3D camera image)
- Value 5 identifies the filter type
  - MPR: identifies Multi Planar Reconstruction images
  - MPR_CV: identifies Multi Planar Reconstruction (curved cut) images
  - MIP: identifies Maximum Intensity Projection images
  - MIP_CV: identifies Maximum Intensity Projection (curved cut) images
  - MINIP: identifies Maximum Intensity Projection images
  - PARALLEL
  - OVERVIEW
  - IMAGE

9.1.1.3.5.2 Image Type Values of Bookmarks

- DERIVED\SECONDARY\OTHER\IAE_BOOKMARK

9.1.1.3.6 Image Pixel Module Attributes – Secondary Capture Image

Table 125: Image Pixel Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Samples per Pixel	(0028,0002)	US	1 (grayscale image) 3 (RGB images)	ALWAYS	FIXED
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2 (grayscale image) RGB (RGB images)	ALWAYS	FIXED
Rows	(0028,0010)	US	512	ALWAYS	FIXED
Columns	(0028,0011)	US	512	ALWAYS	FIXED
Bits Allocated	(0028,0100)	US	16 (grayscale image) 8 (RGB images)	ALWAYS	FIXED
Bits Stored	(0028,0101)	US	12 (grayscale image) 8 (RGB images)	ALWAYS	FIXED
High Bit	(0028,0102)	US	11 (grayscale image) 7 (RGB images)	ALWAYS	FIXED
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	FIXED
Planar Configuration	(0028,0006)	US	0 if Samples per pixel > 1	ANAP	FIXED
Pixel Data	(7FE0,0010)	OB		ALWAYS	AUTO

9.1.1.3.7 SC Image Module Attributes

Table 126: SC Image Module

Attribute	Tag	VR	Value	Presence	Source
Date of Secondary Capture	(0018,1012)	DA	The date the Secondary Capture Image was captured.	ALWAYS	AUTO
Time of Secondary Capture	(0018,1014)	TM	The time the Secondary Capture Image was captured.	ALWAYS	AUTO
Pixel Spacing	(0028,0030)	DS		ANAP	AUTO
Pixel Spacing Calibration Type	(0028,0A02)	CS	From Original	ANAP	COPY
Pixel Spacing Calibration Description	(0028,0A04)	LO	From Original	ANAP	COPY

9.1.1.3.8 Overlay Plane Module Attributes – Secondary Capture Image

Table 127: Overlay Plane Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Overlay Rows	(60xx,0010)	US	512	ALWAYS	FIXED
Overlay Columns	(60xx,0011)	US	512	ALWAYS	FIXED
Overlay Type	(60xx,0040)	CS	G	ALWAYS	FIXED
Overlay Origin	(60xx,0050)	SS	1\1	ALWAYS	FIXED
Image Frame Origin	(60xx,0051)	US	1	ALWAYS	FIXED
Overlay Bits Allocated	(60xx,0100)	US	1	ALWAYS	FIXED
Overlay Bit Position	(60xx,0102)	US	0	ALWAYS	FIXED
Overlay Data	(60xx,3000)	OB		ALWAYS	AUTO
Number of Frames in Overlay	(60xx,0015)	IS	1	ALWAYS	FIXED

Secondary Captures with overlay graphics created by the system are implementing the "Multi-frame Overlay Module" in addition to the "Overlay Plane Module".

That means such images can contain the DICOM Tag (60xx,0015) "Number of Frames in Overlay" even they are no Multi-frame images. The value of the DICOM Tag is always "1".

9.1.1.3.9 SOP Common Module Attributes – Secondary Capture Image

Table 128: SOP Common Module – Secondary Capture Image

Attribute	Tag	VR	Value	Presence	Source
Instance Creation Date	(0008,0012)	DA		ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM		ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG
Original Specialized SOP Class UID	(0008,001B)	UI		ANAP	AUTO
Timezone Offset From UTC	(0008,0201)	SH		ANAP	AUTO
Contributing Equipment Sequence	(0018,A001)	SQ		ANAP	AUTO
>Purpose of Reference Code Sequence	(0040,A170)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	"109102"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	"DCM"	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	"Processing Equipment"	ALWAYS	AUTO
>Manufacturer	(0008,0070)	LO	"Siemens Healthineers"	ALWAYS	FIXED
>Institution Name	(0008,0080)	LO	from WS configuration	ALWAYS	CONFIG
>Institution Address	(0008,0081)	LO		ALWAYS	CONFIG
>Station Name	(0008,1010)	LO		ALWAYS	CONFIG
>Institutional Department Name	(0008,1040)	LO		ALWAYS	CONFIG
>Manufacturer's Model Name	(0008,1090)	LO	SOMATOM go.Now, SOMATOM go.Now Rise, SOMATOM go.Now Wise, SOMATOM go.Up, SOMATOM go.Up Rise, SOMATOM go.All, SOMATOM go.All Rise, SOMATOM go.Top, SOMATOM go.Top Rise, SOMATOM go.Top Wise, SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM Pro.Pulse, SOMATOM Pro.Pulse Velo, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha, SOMATOM On.Site, Syngo Application SW_SYS	ALWAYS	FIXED

Attribute	Tag	VR	Value	Presence	Source
>Device Serial Number	(0018,1000)	LO		ALWAYS	AUTO
Software Versions	(0018,1020)	LO	syngo CT VB10A	ALWAYS	FIXED
Instance Number	(0020,0013)	IS		ALWAYS	AUTO

9.1.1.4 X-Ray Radiation Dose Report Storage SOP Class

The Dose Report object (DOSEREPORT) is based on "1.2.840.10008.5.1.4.1.1.88.67 X-Ray Radiation Dose Report Storage".

Table 129: IOD of created X-Ray Radiation Dose Report SOP Instances

(see also DICOM Standard PS3.3 Section A.35.8.3 X-Ray Radiation Dose SR IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL: Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.
Series	SR Document Series	Table 131	ALWAYS
Equipment	General Equipment	Table 101	ALWAYS
	Enhanced General Equipment	Table 130	ALWAYS
SR Document	SR Document General	Table 132	ALWAYS
	SR Document Content	Table 133	ALWAYS
	SOP Common	Table 134	ALWAYS

9.1.1.4.1 Enhanced General Equipment Module Attributes

Table 130: Enhanced General Equipment Module

Attribute	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO	"Siemens Healthineers"	ALWAYS	FIXED
Manufacturer's Model Name	(0008,1090)	LO	SOMATOM go.Now, SOMATOM go.Now Rise, SOMATOM go.Now Wise, SOMATOM go.Up, SOMATOM go.Up Rise, SOMATOM go.All, SOMATOM go.All Rise, SOMATOM go.Top, SOMATOM go.Top Rise, SOMATOM go.Top Wise, SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM Pro.Pulse, SOMATOM Pro.Pulse Velo, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha, SOMATOM On.Site,	ALWAYS	FIXED
Device Serial Number	(0018,1000)	LO		ALWAYS	FIXED
Software Version	(0018,1020)	LO	syngo CT VB10A	ALWAYS	FIXED

9.1.1.4.2 SR Document Series Module Attributes - X-Ray Radiation Dose SR

Table 131: SR Document Series Module - X-Ray Radiation Dose SR

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	SR	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0008,1030)	LO		ALWAYS	AUTO
Series Description	(0008,103E)	LO		ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		ANAP	AUTO
> Referenced SOP Class UID	(0008,1150)	UI	"1.2.840.10008.3.1.2.3.3" (MPPS)	ALWAYS	AUTO
> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO

9.1.1.4.3 SR Document General Module Attributes – X-Ray Radiation Dose SR

Table 132: SR Document General Module- X-Ray Radiation Dose SR

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS	1-n	ALWAYS	FIXED
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	FIXED
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	FIXED
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ		ALWAYS	EMPTY

9.1.1.4.4 SR Document Content Module Attributes – X-Ray Radiation Dose SR

Table 133: SR Document Content Module – X-Ray Radiation Dose SR

Attribute	Tag	VR	Value	Presence	Source
Referenced SOP Sequence	(0008,1199)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
Value Type	(0040,A040)	CS	CONTAINER	ALWAYS	FIXED
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	113701	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	"X-Ray Radiation Dose Report"	ALWAYS	FIXED
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	FIXED
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	DCMR	ALWAYS	FIXED
>Template Identifier	(0040,DB00)	CS	10011	ALWAYS	FIXED
Content Sequence	(0040,A730)	SQ	See Table 168: CT Radiation Dose (TID 10011)	ALWAYS	AUTO

9.1.1.4.5 SOP Common Module Attributes - X-Ray Radiation Dose SR

Table 134: SOP Common Module - X-Ray Radiation Dose SR

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.67	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG
Timezone Offset From UTC	(0008,0201)	SH		ANAP	AUTO

9.1.1.5 Enhanced SR Storage SOP Class

The Examination Report object is based on "1.2.840.10008.5.1.4.1.1.88.22 Enhanced SR Storage"

Table 135: IOD of created Enhanced SR SOP Instances

(see also DICOM Standard PS3.3 Section A.35.2.3 Enhanced SR IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL: Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.
Series	SR Document Series	Table 131	ALWAYS
Equipment	General Equipment	Table 136	ALWAYS
SR Document	SR Document General	Table 132	ALWAYS
	SR Document Content	Table 138	ALWAYS
	SOP Common	Table 140	ALWAYS

9.1.1.5.1 General Equipment Module Attributes – Enhanced SR

Table 136: General Equipment Module – Enhanced SR

Attribute	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO	"Siemens Healthineers"	ALWAYS	FIXED
Institution Name	(0008,0080)	LO	from WS Configuration	ALWAYS	CONFIG
Institution Address	(0008,0081)	ST	from WS Configuration	ALWAYS	CONFIG
Station Name	(0008,1010)	SH	from WS Configuration	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	LO	from WS Configuration	ALWAYS	CONFIG
Manufacturer's Model Name	(0008,1090)		SOMATOM go.Now, SOMATOM go.Now Rise, SOMATOM go.Now Wise, SOMATOM go.Up, SOMATOM go.Up Rise, SOMATOM go.All, SOMATOM go.All Rise, SOMATOM go.Top, SOMATOM go.Top Rise, SOMATOM go.Top Wise, SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM Pro.Pulse, SOMATOM Pro.Pulse Velo, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha, SOMATOM On.Site	ALWAYS	FIXED
Device Serial Number	(0018,1000)	LO		ALWAYS	FIXED
Software Versions	(0018,1020)	LO	syngo CT VB10A	ALWAYS	FIXED
Date of Last Calibration	(0018,1200)	DA		ANAP	AUTO
Time of Last Calibration	(0018,1201)	TM		ANAP	AUTO

9.1.1.5.2 SR Document General Module Attributes – Enhanced SR

Table 137: SR Document General Module - Enhanced SR

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS	1	ALWAYS	FIXED
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	FIXED
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	FIXED
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Verifying Observer Sequence	(0040,A073)	SQ		ANAP	AUTO
Referenced Request Sequence	(0040,A370)	SQ		ANAP	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ		VNAP	AUTO
Current Requested Procedure Evidence Sequence	(0040,A375)	SQ		ANAP	AUTO
Referenced Instance Sequence	(0008,114A)	SQ		ANAP	AUTO
Identical Documents Sequence	(0040,A525)	SQ	Only in case of Multi-Study	ANAP	AUTO

9.1.1.5.3 SR Document Content Module Attributes - Enhanced SR

Table 138: SR Document Content Module - Enhanced SR "

Attribute	Tag	VR	Value	Presence	Source
Referenced SOP Sequence	(0008,1199)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
Value Type	(0040,A040)	CS	CONTAINER	ALWAYS	FIXED
Temporal Range Type	(0040,A130)	CS		ALWAYS	FIXED
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	1	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	99CT_SOMX	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	“CT Examination Report”	ALWAYS	FIXED
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	FIXED
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	99CT_SOMX	ALWAYS	FIXED
>Template Identifier	(0040,DB00)	CS	“EXAMREPORT”	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ	See Table 176: CT Examination SR	ALWAYS	AUTO

9.1.1.5.4 SR Document Series Module Attributes - Enhanced SR

Table 139: SR Document Series Module

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	SR	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0008,1030)	LO		ALWAYS	AUTO
Series Description	(0008,103E)	LO		ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		ANAP	AUTO
> Referenced SOP Class UID	(0008,1150)	UI	“1.2.840.10008.3.1.2.3.3" (MPPS)	ALWAYS	AUTO
> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO

9.1.1.5.5 SOP Common Module Attributes - Enhanced SR

Table 140: SOP Common Module - Enhanced SR

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.22	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG
Coding Scheme Identification Sequence	(0008,0110)	SQ		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	99CT_SOMX	ALWAYS	FIXED
>Coding Scheme Responsible Organization	(0008,0116)	ST	"Siemens Healthineers"	ALWAYS	FIXED
>Coding Scheme Name	(0008,0115)	ST	CT Structured Report Content for Somaris/10	ALWAYS	FIXED
Timezone Offset From UTC	(0008,0201)	SH		ANAP	AUTO

9.1.1.6 Comprehensive SR SOP Class

Table 141: IOD of created Comprehensive SR SOP Instances

(see also DICOM Standard PS3.3 Section A.35.3.3 Comprehensive SR IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 142	ALWAYS
Study	General Study	Table 143	ALWAYS
Series	SR Document Series	Table 146	ALWAYS
Equipment	General Equipment	Table 144	ALWAYS
SR Document	SR Document General	Table 145	ALWAYS
	SR Document Content	Table 147	ALWAYS
	SOP Common	Table 148	ALWAYS

9.1.1.6.1 Patient Module Attributes

Table 142: Patient Module

Attribute	Tag	VR	Value	Presence	Source
Patient's Name	(0010,0010)	PN		ALWAYS	MWL, USER, AUTO[6]
Patient ID	(0010,0020)	LO		ALWAYS	MWL, USER, AUTO[6]
Patient's Birth Date	(0010,0030)	DA		ALWAYS	MWL, USER, AUTO[6]
Patient's Sex	(0010,0040)	CS	M, F,O	ALWAYS	MWL, USER, AUTO[6]

9.1.1.6.2 General Study Module Attributes

Table 143: General Study Module

Attribute	Tag	VR	Value	Presence	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL, AUTO
Study Date	(0008,0020)	DA		ALWAYS	MWL, AUTO
Study Time	(0008,0030)	TM		ALWAYS	MWL, AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	MWL
Study ID	(0020,0010)	SH		ANAP	MWL, AUTO
Accession Number	(0008,0050)	SH		VNAP	MWL, USER

9.1.1.6.3 General Equipment Module Attributes – Comprehensive SR

Table 144: General Equipment Module – Comprehensive SR

Attribute	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO	"Siemens Healthineers"	ALWAYS	FIXED

9.1.1.6.4 SR Document General Module Attributes – Comprehensive SR

Table 145: SR Document General Module - Comprehensive SR

Attribute	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS	1	ALWAYS	FIXED
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	FIXED
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	FIXED
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ	EMPTY	VNAP	AUTO

9.1.1.6.5 SR Document Series Module Attributes - Comprehensive SR

Table 146: SR Document Series Module - Comprehensive SR

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	SR	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Protocol Name	(0008,1030)	LO		ALWAYS	AUTO
Series Description	(0008,103E)	LO		ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		ANAP	AUTO
> Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO

9.1.1.6.6 SR Document Content Module Attributes - Comprehensive SR

Table 147: SR Document Content Module - Comprehensive SR

Attribute	Tag	VR	Value	Presence	Source
Referenced SOP Sequence	(0008,1199)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
Value Type	(0040,A040)	CS	CONTAINER	ALWAYS	FIXED
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	FIXED
Temporal Range Type	(0040,A130)	CS		ALWAYS	FIXED
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	121070	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO		ALWAYS	FIXED
Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	111176	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	unspecified	ALWAYS	FIXED

9.1.1.6.7 SOP Common Module Attributes - Comprehensive SR

Table 148: SOP Common Module - Comprehensive SR

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.33	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG

9.1.1.7 Spatial Registration SOP Class

Table 149: IOD of created Spatial Registration SOP Instances

(see also DICOM Standard PS3.3 Section A.39.1.3 Spatial Registration IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
	Patient Study	Table 98	CONDITIONAL
Series	General Series	Table 151	ALWAYS
Equipment	General Equipment	Table 101	ALWAYS
Frame of Reference	Frame of Reference	Table 150	ALWAYS
Spatial Registration	Spatial Registration	Table 152	ALWAYS
	Common Instance Reference	Table 153	ALWAYS
	SOP Common	Table 154	ALWAYS

9.1.1.7.1 Frame of Reference Module Attributes

Table 150: Frame of Reference Module

Attribute	Tag	VR	Value	Presence	Source
Frame of Reference UID	(0020,0052)	UI	Copied from object to which the registration result applies.	ALWAYS	COPY
Position Reference Indicator	(0020,1040)	LO	If applicable, copied from original image (volume in registered space) to which the registration result applies.	VNAP	COPY

9.1.1.7.2 Spatial Registration General Series Module Attributes

Table 151: General Series Module

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	REG	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI	1.3.12.2.1107.5.1.7.*Device Serial Number.object-identifier*	ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Laterality	(0020,0060)	CS		EMPTY	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	"Fusion3D3D"	ALWAYS	AUTO
Series Number	(0020,0011)	IS	960	ALWAYS	FIXED
Series Description	(0008,103E)	LO		ANAP	USER
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		ANAP	MWL
> Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	MWL
> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	MWL
Body Part Examined	(0018,0015)	CS		ALWAYS	AUTO
Patient Position	(0018,5100)	CS		ALWAYS	AUTO
Request Attributes Sequence	(0040,0275)	SQ		ANAP	MWL
>Requested Procedure ID	(0040,1001)	SH		ALWAYS	MWL, USER, AUTO
>Accession Number	(0008,0050)	SH		ALWAYS	MWL, USER, AUTO
>Study Instance UID	(0020,000D)	UI		ALWAYS	MWL, USER, AUTO
>Requested Procedure Description	(0032,1060)	LO		ANAP	MWL
>Requested Procedure Code Sequence	(0032,1064)	SQ		ANAP	MWL
>>Code Value	(0008,0100)	SH		ALWAYS	MWL
>>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	MWL
>>Code Meaning	(0008,0104)	LO		ALWAYS	MWL
>Reason for the Requested Procedure	(0040,1002)	LO		VNAP	MWL
>Requested Procedure Comments	(0040,1400)	LT		VNAP	MWL
>Scheduled Procedure Step Description	(0040,0007)	LO		ANAP	MWL
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		ANAP	MWL
>Scheduled Procedure Step ID	(0040,0009)	SH		ANAP	MWL
>>Code Value	(0008,0100)	SH		ALWAYS	MWL
>>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	MWL
>>Code Meaning	(0008,0104)	LO		ALWAYS	MWL

Attribute	Tag	VR	Value	Presence	Source
Performed Procedure Step ID	(0040,0253)	SH		ALWAYS	MWL AUTO
Performed Procedure Step Start Date	(0040,0244)	DA		ALWAYS	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM		ALWAYS	AUTO
Performed Procedure Step Description	(0040,0254)	LO		ANAP	MWL AUTO
Performed Protocol Code Sequence	(0040,0260)	SQ		ANAP	AUTO
>Code Value	(0008,0100)	SH		ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH		ALWAYS	AUTO

9.1.1.7.3 Spatial Registration Module Attributes

Table 152: Spatial Registration Module

Attribute	Tag	VR	Value	Presence	Source
Content Label	(0070,0080)	CS	"<YYYYMMDDHHMM>_REG"	ALWAYS	AUTO
Content Description	(0070,0081)	LO		ALWAYS	AUTO, USER
Content Creator's Name	(0070,0084)	PN	"3D3Dregistration"	ALWAYS	AUTO
Registration Sequence	(0070,0308)	SQ	Two items, one "identity transformation" for the volume in the registered space, to which the volume specified in the second item, is registered to.	ALWAYS	AUTO
>Referenced Image Sequence	(0008,1140)	SQ	Reference to the volume in the registered space	ANAP	AUTO
>Frame of Reference UID	(0020,0052)	UI	FoR of volume in the registered space	ALWAYS	AUTO
>Matrix Registration Sequence	(0070,0309)	SQ		ALWAYS	AUTO
>>Matrix Sequence	(0070,030A)	SQ		ALWAYS	AUTO
>>>Frame of Reference Trans-formation Matrix Type	(0070,030C)	CS		ALWAYS	AUTO
>>>Frame of Reference Transformation Matrix	(3006,00C6)	DS	"identity transformation" specified.	ALWAYS	AUTO
>>Registration Type Code Sequence	(0070,030D)	SQ	(125021, DCM, "Frame of Reference Identity")	ALWAYS	AUTO

9.1.1.7.4 Common Instance Reference Module Attributes

Table 153: Common Instance Reference Module

Attribute	Tag	VR	Value	Presence	Source
Referenced Series Sequence	(0008,1115)	SQ	Used if both volumes are in same study. One item for each volume (registered space, registered volume)	ANAP	AUTO
>Referenced Instance Sequence	(0008,114A)	SQ		ÁNAP	AUTO
>Series Instance UID	(0020,000E)	UI		ANAP	AUTO
Studies Containing Other Referenced Instances Sequence	(0008,1200)	SQ	Used if both volumes are related to different studies	ALWAYS	AUTO
>Series Instance UID	(0020,000E)	UI		ANAP	AUTO
>Study Instance UID	(0020,000D)	UI		ANAP	AUTO

9.1.1.7.5 SOP Common Module Attributes – Spatial Registration

Table 154: SOP Common Module – Spatial Registration

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.66.1	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG

9.1.1.8 RT Structure Set Storage SOP Class

Table 155: IOD of created RT Structure Set SOP Instances

(see also DICOM Standard PS3.3 Section A.19.3 RT Structure Set IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	M
Study	General Study	Table 97	M
Series	RT Series	Table 156	M
Equipment	General Equipment	Table 101	M
Structure Set	Structure Set	Table 157	M
	ROI Contour	Table 158	M
	RT ROI Observations	Table 159	M
	Approval	Table 160	M
	Common Instance Reference	Table 153	M
	SOP Common	Table 161	M

9.1.1.8.1 RT Series Module Attributes

Table 156: RT Series Module

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS	RTSTRUCT	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS	e.g. 940 for Ranges, from Original for all other Derived Volume Data	ALWAYS	AUTO, COPY
Series Date	(0008,0021)	DA		ANAP	AUTO
Series Time	(0008,0031)	TM		ANAP	AUTO

9.1.1.8.2 Structure Set Module Attributes

Table 157: Structure Set Module

Attribute	Tag	VR	Value	Presence	Source
Structure Set Label	(3006,0002)	SH	User-defined label for Structure Set	ALWAYS	USER
Structure Set Date	(3006,0008)	DA		ALWAYS	AUTO
Structure Set Time	(3006,0009)	TM		ALWAYS	AUTO
Referenced Frame of Reference Sequence	(3006,0010)	SQ		ALWAYS	AUTO
>Frame of Reference UID	(0020,0052)	UI		ALWAYS	AUTO
>RT Referenced Study Sequence	(3006,0012)	SQ	.	ALWAYS	AUTO
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
>>RT Referenced Series Sequence	(3006,0014)	SQ		ALWAYS	AUTO
>>>Series Instance UID	(0020,000E)	UI		ANAP	AUTO
>>>Contour Image Sequence	(3006,0016)	SQ		ANAP	AUTO
>>>>Referenced SOP Class UID	(0008,1155)	UI	“1.2.840.10008.5.1.4.1.1.2”	ALWAYS	AUTO
Structure Set ROI Sequence	(3006,0020)	SQ		ALWAYS	AUTO
>ROI Number	(3006,0022)	IS		ALWAYS	AUTO
>Referenced Frame of Reference UID	(3006,0024)	UI		ALWAYS	AUTO
>ROI Name	(3006,0026)	LO		ALWAYS	USER
>ROI Generation Algorithm	(3006,0036)	CS	AUTOMATIC, SEMIAUTOMATIC, or MANUAL	ALWAYS	USER

9.1.1.8.3 RT Contour Module Attributes

Table 158: RT Contour Module

Attribute	Tag	VR	Value	Presence	Source
ROI Contour Sequence	(3006,0039)	SQ		ALWAYS	AUTO
>Contour Sequence	(3006,0040)	SQ		ALWAYS	AUTO
>>Contour Image Sequence	(3006,0016)	SQ	Shall be present with a single item. This item is the image upon which this contour should be placed	ALWAYS	AUTO
>>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
>>Contour Geometric Type	(3006,0042)	CS	A value of POINT or CLOSED_PLANAR	ALWAYS	AUTO
>>Number of Contour Points	(3006,0046)	IS		ALWAYS	AUTO
>>Contour Data	(3006,0050)	DS		ALWAYS	AUTO

9.1.1.8.4 RT ROI Observations Module Attributes

Table 159: RT ROI Observations Module

Attribute	Tag	VR	Value	Presence	Source
RT ROI Observations Sequence	(3006,0080)	SQ		ALWAYS	AUTO
>Referenced ROI Number	((3006,0084)	IS		ALWAYS	AUTO
>RT ROI Interpreted Type	(3006,00A4)	CS		ALWAYS	USER
>>ROI Physical Property	(3006,00B2)	CS	REL_ELEC_DENSITY	ALWAYS	FIXED

9.1.1.8.5 Approval Module Attributes

Table 160: Approval Module

Attribute	Tag	VR	Value	Presence	Source
Approval Status	(300E,0002)	CS	APPROVED, UNAPPROVED, REJECTED	ALWAYS	AUTO

9.1.1.8.6 SOP Common Module Attributes – RT Structure Set

Table 161: SOP Common Module – RT Structure Set

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.481.3	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG

9.1.1.9 Surface Segmentation SOP Class

Table 162: IOD of created Surface Segmentation SOP Instances

(see also DICOM Standard PS3.3 Section A.57.3 Surface Segmentation IOD Modules)

IE	Module	Reference	Presence of Module
Patient	Patient	Table 96	ALWAYS
Study	General Study	Table 97	ALWAYS
Series	General Series	Table 156	ALWAYS
	Segmentation Series	Table 163	ALWAYS
Equipment	General Equipment	Table 101	ALWAYS
	Enhanced General Equipment	Table 130	ALWAYS
Frame of Reference	Frame of Reference	Table 100	ALWAYS
Surface Segmentation	Surface Segmentation	Table 164	ALWAYS
	Surface Mesh	Table 165	ALWAYS
	SOP Common	Table 166: SOP Common Module – Surface Segmentation	ALWAYS

9.1.1.9.1 Segmentation Series Module Attribute

Table 163: Segmentation Series Module

Attribute	Tag	VR	Value	Presence	Source
Modality	(0008,0060)	CS		ALWAYS	FIXED
Series Number	(0020,0011)	IS		ALWAYS	AUTO

9.1.1.9.2 Surface Segmentation Module Attributes

Table 164: Surface Segmentation Module

Attribute	Tag	VR	Value	Presence	Source
Segment Sequence	(0062,0002)	SQ		ALWAYS	AUTO
> Segment Number	(0062,0004)	US		ALWAYS	AUTO
> Segment Label	(0062,0005)	LO		ALWAYS	AUTO
> Segment Algorithm Type	(0062,0008)	CS		ALWAYS	AUTO
> Segmented Property Category Code Sequence	(0062,0003)	SQ		ALWAYS	AUTO
>> Code Value	(0008,0100)	SH		ANAP	AUTO
>>Coding Scheme Designator	(0008,0102)	SH		ANAP	AUTO
>> Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
> Surface Count	(0066,002A)		> 0	ALWAYS	AUTO
> Segmented Property Type Code Sequence	(0062,000F)	SQ		ALWAYS	AUTO
>> Code Value	(0008,0100)	SH		ANAP	AUTO
>> Coding Scheme Designator	(0008,0102)	SH		ANAP	AUTO
>> Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
> Referenced Surface Sequence	(0066,002B)	SQ		ALWAYS	AUTO
>> Referenced Surface Number	(0066,002C)	UL		ALWAYS	AUTO
>> Segment Surface Generation Algorithm Identification Sequence	(0066,002D)	SQ		ALWAYS	AUTO
>>> Algorithm Family Code Sequence	(0066,002F)	SQ		ALWAYS	AUTO
>>>> Code Value	(0008,0100)	SH		ANAP	AUTO
>>>> Coding Scheme Designator	(0008,0102)	SH		ANAP	AUTO
>>>> Code Meaning	(0008,0104)	SH		ALWAYS	AUTO
>>> Algorithm Version	(0066,0031)	LO		ALWAYS	AUTO
>>> Algorithm Name	(0066,0036)	LO	“NeedleGuidance”	ALWAYS	FIXED
>> Segment Surface Source Instance Sequence	(0066,002E)	SQ		VNAP	AUTO
>>> Referenced SOP Class UID	(0008,1150)	UI	From original image’s SOP Class UID	ALWAYS	COPY
>>> Referenced SOP Instance UID	(000f8,1155)	UI	From original image’s SOP Instance UID	ALWAYS	COPY

Attribute	Tag	VR	Value	Presence	Source
Content Label	(0070,0080)	CS		ALWAYS	AUTO
Content Description	(0070,0081)	LO		VNAP	AUTO
Content Creator Name	(0070,0084)	PN		VNAP	AUTO

9.1.1.9.3 Surface Mesh Module Attributes

Table 165: Surface Mesh Module

Attribute	Tag	VR	Value	Presence	Source
Number Of Surfaces	(0066,0001)	UL		ALWAYS	AUTO
Surface Sequence	(0066,0002)	SQ		ALWAYS	AUTO
>Recommended Display Grayscale Value	(0062,000C)	US		ALWAYS	AUTO
>Recommended Display CIELab Value	(0062,000D)	US		ALWAYS	AUTO
>Surface Number	(0066,0003)	UL		ALWAYS	AUTO
>Surface Comments	(0066,0004)	LT	needle geometry"	ANAP	FIXED
>Surface Processing	(0066,0009)	CS		VNAP	AUTO
>Recommended Presentation Opacity	(0066,000C)	FL	1.0	ALWAYS	AUTO
>Recommended Presentation Type	(0066,000D)	CS	WIREFRAME	ALWAYS	FIXED
>Finite Volume	(0066,000E)	CS		ALWAYS	AUTO
>Manifold	(0066,0010)	CS		ALWAYS	AUTO
>Surface Points Sequence	(0066,0011)	SQ		ALWAYS	AUTO
>>Number Of Surface Points	(0066,0015)	UL		ALWAYS	AUTO
>>Point Coordinates Data	(0066,0016)	OF		ALWAYS	AUTO
>Surface Points Normals Sequence	(0066,0012)	SQ		VNAP	AUTO
>Surface Mesh Primitives Sequence	(0066,0013)	SQ		ALWAYS	AUTO
>>Line Sequence	(0066,0028)	SQ		VNAP	AUTO
>>>Long Primitive Point Index List	(0066,0040)	OL		ALWAYS	AUTO

9.1.1.9.4 SOP Common Module

Table 166: SOP Common Module – Surface Segmentation

Attribute	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.66.5	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI	"1.3.12.2.1107.5.1.7." + serial number + part created per SOP Instance	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	MWL, AUTO, CONFIG

9.1.2 Usage of Attributes from received IODs

N/A

9.1.3 Attribute mapping

For details regarding the mapping between Modality Worklist and created object, refer to Section 9.1.1 Created SOP Instances

For the mapping between Modality Worklist and MPPS, refer to section 4.2.6 Modality Performed Procedure Step AE Specification.

9.1.4 Coerced / Modified fields

N/A

9.2 Data Dictionary of Private Attributes

Table 167 lists private attributes which may be included in instances generated by the ***syngo CT VB10A***. These private attributes may be deprecated or replaced with standard attributes in the future.

Table 167: Private Data Element Dictionary

DICOM Tag	Name	VR	VM
(0029,SIEMENS CSA ENVELOPE,10)	syngo Report Data	OB	1
(0029,SIEMENS CSA ENVELOPE,11)	syngo Report Presentation	OB	1
(0029,SIEMENS CSA HEADER,08)	Modality Image Header Type	CS	1
(0029,SIEMENS CSA HEADER,09)	Modality Image Header Version	LO	1
(0029,SIEMENS CSA HEADER,10)	Modality Image Header Info	OB	1
(0029,SIEMENS CSA HEADER,18)	Modality Series Header Type	CS	1
(0029,SIEMENS CSA HEADER,19)	Modality Series Header Version	LO	1
(0029,SIEMENS CSA HEADER,20)	Modality Series Header Info	OB	1
(0029,SIEMENS CSA NON-IMAGE,08)	Modality Data Header Type	CS	1
(0029,SIEMENS CSA NON-IMAGE,09)	Modality Data Header Version	LO	1
(0029,SIEMENS CSA NON-IMAGE,10)	Modality Data Header Info	OB	1
(7FE1,SIEMENS CSA NON-IMAGE,10)	Modality Data	OB	1
(0029,SIEMENS CSA REPORT,08)	syngo Report Type	CS	1
(0029,SIEMENS CSA REPORT,09)	syngo Report Version	LO	1
(0029,SIEMENS CSA REPORT,15)	SR Variant	US	1
(0029,SIEMENS CSA REPORT,17)	SC SOP Instance UID	UI	1
(0019, SIEMENS CT DOSE, 11)	Dose Info	OB	1
(0029,SIEMENS MEDCOM HEADER,40)	Application Header Sequence	SQ	1
(0029,SIEMENS MEDCOM HEADER,41)	Application Header Type	CS	1
(0029,SIEMENS MEDCOM HEADER,42)	Application Header ID	LO	1
(0029,SIEMENS MEDCOM HEADER,43)	Application Header Version	LO	1
(0029,SIEMENS MEDCOM HEADER,44)	Application Header Info	OB	1
(0029,SIEMENS MEDCOM HEADER,70)	Siemens Link Sequence	SQ	1
(0029,SIEMENS MEDCOM HEADER,71)	Referenced Tag	AT	1
(0029,SIEMENS MEDCOM HEADER,72)	Referenced Tag Type	CS	1
(0029,SIEMENS MEDCOM HEADER,73)	Referenced Value Length	UL	1
(0029,SIEMENS MEDCOM HEADER,74)	Referenced Object Device Type	CS	1
(0029,SIEMENS MEDCOM HEADER,75)	Referenced Object Device Location	OB	1
(0029,SIEMENS MEDCOM HEADER,76)	Referenced Object ID	OB	1
(0029,SIEMENS MEDCOM HEADER,77)	Referenced Object Offset	UL	1
(0029,SIEMENS MEDCOM HEADER2,60)	Series Work Flow Status	LO	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,08)	Object Series Instance UID	UI	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,09)	Model Series Instance UID	UI	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,10)	Matrix Referenced Series Instance UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,00)	Presentation Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,01)	Presentation Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,02)	Advanced Presentation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,03)	Time Point Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,04)	Base Image Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,05)	Overlay Image Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,06)	Registration Instance Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,07)	Real World Value Mapping Instance Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,08)	Measurement Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,09)	Measurement UID	UI	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,10)	Segmentation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,11)	Segmentation UID	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,12)	Navigation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,13)	Navigation Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,14)	Auto Navigation Direction	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,15)	Auto Navigation Frame Rate	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,16)	Auto Navigation Mode	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,17)	Auto Navigation Realtime Speed	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,18)	Auto Navigation Strategy	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,19)	Auto Navigation Realtime Flag	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,20)	Index Navigation Current Index	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,21)	Index Auto Navigation Skipping Degree	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,22)	Volume Navigation Minimum Pixel Spacing	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,23)	Volume Navigation Scroll Unit	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,24)	Volume Navigation Step Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,25)	Volume Navigation Jump Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,26)	Referenced Registration Number	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,27)	Real World Value Mapping UID	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,28)	Channel Alpha Value	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,30)	Measurement Application Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,31)	Measurement Data Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,32)	Measurement Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,33)	Measurement Frame of Reference UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,34)	Measurement Uid	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,35)	Measurement Application Number	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,36)	Measurement Application Number Prefix Text	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,37)	Measurement Graphic Is Visible Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,38)	Referenced Syngo Uid	UI	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,39)	Clinical Finding Uid	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3A)	Measurement Evaluation String Value	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3B)	Measurement Evaluation Integer Value	IS	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3C)	Measurement Evaluation Decimal Value	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3D)	Measurement Line Show Center Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3E)	Measurement Angle Show ArrowTip Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3F)	Camera Home Settings Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,40)	Camera Zoom	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,41)	Camera Position	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,42)	Camera Orientation	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,43)	Camera Far Clip Plane	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,44)	Camera Near Clip Plane	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,46)	Camera ViewPort Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,47)	Camera Aspect Ratio	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,48)	Camera Projection Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,49)	Camera Field of View	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4A)	Camera Image Plane Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4B)	Camera Image Maximum Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4C)	Camera Image Minimum Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4D)	ParallelShift Interval MM	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4E)	Measurement ArrowTip Size	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4F)	Measurement ArrowTip Size ScalingFactor	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,50)	Renderer Vertex Is Characteristic Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,51)	Renderer Thickness Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,52)	Renderer Threshold	DS	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,53)	Renderer Material	DS	4-8
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,54)	Renderer DirectionalLight Color	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,55)	Renderer DirectionalLight Direction	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,56)	Renderer DirectionalLight TwoSide Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,57)	Renderer PWL TransferFunction Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,58)	Renderer PWL Vertex Index	IS	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,59)	Renderer PWL Vertex Color	DS	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5A)	Renderer Is Camera Required Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5B)	Renderer Do Depth Test Flag	CS	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5C)	Renderer DirectionalLight Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5D)	Renderer Thickness Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5E)	Renderer Slice Spacing Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5F)	Renderer Sampling Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,60)	Renderer Initial Sampling Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,61)	Segmentation Display Data Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,62)	Segmentation Display Data UID	ST	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,63)	Segmentation Display Parameter Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,64)	Segmentation Display Parameter Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,65)	Segmentation Display Visibility	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,66)	Segmentation Display Color	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,67)	Segmentation Display Is Selected Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,68)	Segmentation Additional Information Blob	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,69)	Hash Code Value	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,6A)	Segmentation Version Identifier	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,6B)	Segmentation Lock Mode	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,70)	Segmentation Volume Size	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7A)	Segmentation Volume StorageDataType	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7B)	Segmentation Volume Model Matrix	FL	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7C)	Segmentation Display Is Applied Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7D)	Display Representation Instance Identifier	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,71)	Registration Referenced Frames	UI	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,72)	Registration Referenced Registrations	UI	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,73)	Registration Creation Algorithm Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,74)	ECG Graphic Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,75)	Hidden Pixel Spacing	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,76)	Renderer Edge Enhancement Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,77)	Renderer Gradient Modulated Opacity Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,78)	Renderer Volume Smoothing Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7E)	Fused Presentation LUT Shape	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7F)	Overlay Graphic VisibleFlag	CS	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,80)	Camera Rotation Axis	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,81)	Overlay Hidden Display Attributes	SL	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,82)	Presentation State Group Identifier	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,83)	Temporary Smallest Image Pixel Value	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,84)	Camera Rotation Center	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,85)	Camera Rotation Center Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,86)	Camera Parallel Epiped	DS	12
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,87)	Camera Max Zoom In Factor	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,88)	Camera Min Zoom In Factor	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,89)	Temporary Largest Image Pixel Value	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8A)	Camera Rotation Axis Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8B)	Measurement Surface Normal	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8C)	Measurement Ellipsoid Model Matrix	FL	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8D)	Measurement Evaluation DataRole ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8E)	Measurement Algorithm Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,91)	Measurement Evaluation DataRole Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,93)	Measurement Evaluation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,94)	Measurement Evaluation Value	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,95)	Measurement Evaluation ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,96)	Measurement Data Points	FL	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,97)	Measurement Data Angles	FL	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,98)	Measurement Data Slice	FD	9
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,99)	Measurement Data Slice Thickness	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9A)	Measurement Referenced Frames Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9B)	Measurement Evaluation Longest Distance	DS	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9C)	Measurement Evaluation Centroid	DS	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9D)	Measurement Data Bounding Box	FL	6
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9E)	Measurement Text	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9F)	Measurement Diameter	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A0)	Image Rotation Fractional	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A1)	Preset Name	LO	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A2)	Fusion LUT Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A3)	Fusion LUT Is Active Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A4)	Scale To Fit Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A5)	Syngo UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A6)	Presentation Version Identifier	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A7)	Presentation Module Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A8)	Presentation Module Type	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A9)	Presentation State Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AA)	LUT Inverted Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AB)	Softcopy Voi Lut Viewing Index	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AC)	Displayed Area Bottom Right Hand Corner Fractional	FD	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AD)	Displayed Area Top Left Hand Corner Fractional	FD	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AE)	Measurement Alpha	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AF)	Measurement Bitmap	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B0)	Current Frame Number	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B1)	ImageText View Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B2)	ImageText View Content Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B3)	ImageText Line Names	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B4)	ImageText Line Values	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B5)	Measurement Evaluation Text Position Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B6)	Measurement Link Evaluation Text Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B7)	Measurement Evaluation Text Position Vector	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B8)	ImageText Alpha Blending Line Value	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B9)	ImageText Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BA)	ImageText Reduced	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BB)	ImageText Minimal	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BC)	ImageText ViewID	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BD)	Unlinked Image Text View Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C1)	Task Data Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C2)	Task Data Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C3)	Task Data Version	LO	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C4)	Task Data Description	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C5)	Task Data	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C6)	Task Data Size	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C7)	True Size Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C8)	Image Graphics Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C9)	Clip Plane Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CA)	Clip Plane Center	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CB)	Clip Plane Normal	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CC)	Clip Plane Scale	DS	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CD)	Clip Plane Use Thickness Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CE)	Clip Plane Thickness	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CF)	Image Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D0)	Clip Plane Enable Clip	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D1)	Clip Plane Handle Ratio	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D2)	Clip Plane Bounding Points	DS	24
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D3)	Clip Plane Motion Matrix	DS	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D4)	Clip Plane Shift Velocity	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D5)	Clip Plane Enabled Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D6)	Clip Plane Rotate Velocity	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D7)	Clip Plane Show Graphics Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E0)	Crop Box Size	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E1)	Crop Box Enabled Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E2)	Crop Box Absolute Origin	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E3)	Crop Box Show Graphics Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E4)	Renderer Filter Settings Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E5)	Renderer Energy Conversion Lut	OF	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E6)	Apply Fusion	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E7)	RepresentationId	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EE)	Advanced Display Representation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EF)	Measurement Visibility In View	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F0)	Measurement Label Text	ST	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F1)	Curved Camera Coordinates	DS	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F2)	Curved Camera Point Of Interest	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F3)	Curved Camera Point Of Interest Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F4)	Curved Camera Thickness	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F5)	Curved Camera Extrusion Length	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F6)	Curved Camera Rotation Axis Mode	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F7)	Curved Camera Roll Rotation Axis	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F8)	Curved Camera View Port Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F9)	Curved Camera Cut Direction	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FA)	Curved Camera Pan Vector	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FB)	Clinical Finding ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FC)	Measurement Is Circle Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FD)	Measurement Application TypeID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FE)	Measurement Default Evaluation Text Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FF)	Measurement Font Height	SL	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,00)	Measurement Min Threshold Value	SL	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,01)	Measurement Max Threshold Value	SL	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,06)	Measurement Roi Binary Mask	UT	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,08)	Segmentation Double Threshold	DS	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,09)	Serialized Custom Attributes	UT	1
(0029,SIEMENS SYNGO ALPHA CAD,10)	Automatic Landmarking and Parsing of Human Anatomy Version	CS	1
(0029,SIEMENS SYNGO ALPHA CAD,12)	Automatic Landmarking and Parsing of Human Anatomy Body Regions	SQ	1
(7FDF,SIEMENS SYNGO DATA PADDING,FC)	Pixel Data Leading Padding	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,20)	Study Model	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,30)	Report XML Schema	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,40)	Report Identifier	OB	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,01)	Business Unit Code	CS	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,02)	Application Type	LO	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,03)	Application Attributes Sequence	SQ	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,10)	Evidence Document Template ID	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,11)	Evidence Document Template Version	DS	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,20)	Evidence Document Clinical Finding Data	OB	1

DICOM Tag	Name	VR	VM
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,21)	Evidence Document Metadata	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,30)	Evidence Document Implementation Version	DS	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,40)	Evidence Document Predecessor	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,50)	Evidence Document Logical ID	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,60)	Evidence Document Application Data	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,70)	Evidence Document Owner Clinical Task Name	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,71)	Evidence Document Owner Task Name	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,80)	Evidence Document Owner Supported Templates	OB	1
(0029,SIEMENS SYNGO FRAME SET,10)	Image Frame Sequence	SQ	1
(0029,SIEMENS SYNGO FRAME SET,12)	Type of Progression	CS	1
(0029,SIEMENS SYNGO FRAME SET,14)	Representation Level	IS	1
(0029,SIEMENS SYNGO FRAME SET,16)	Representation Information Sequence	SQ	1
(0029,SIEMENS SYNGO FRAME SET,18)	Number of Representations	IS	1
(0029,SIEMENS SYNGO FRAME SET,20)	Representation Pixel Offset	IS	1
(0029,SIEMENS SYNGO FUNCTION ASSIGNMENT,01)	Data Reference	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,20)	Object Insertion Date	DA	1
(0009,SIEMENS SYNGO INDEX SERVICE,30)	Instance Object States	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,31)	Series Object States	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,40)	Last Access Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,41)	Delete Protected Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,42)	Received from Archive Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,43)	Archive Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,44)	Location	AE	1
(0009,SIEMENS SYNGO INDEX SERVICE,45)	Logical Deleted Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,46)	Insert Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,47)	Visible Instances on Series Level	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,48)	Series Archived	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,49)	Visible Instances on Study Level	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,4A)	Series Completed	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,4B)	Delete Protection Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,4C)	Delete Protection User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,4D)	Study Marked Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,4E)	Study Marked User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,4F)	Series Delete Protected	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,50)	Hidden Instance	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,51)	Frame Number	UL	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,60)	Data Handling Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,61)	Result Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,62)	Clinical Result Attribute	US	1
(0009,SIEMENS SYNGO INDEX SERVICE,63)	Instance Origin	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,64)	DM file relative location for store	LT	1
(0009,SIEMENS SYNGO INDEX SERVICE,70)	Header Offset	UL	1
(0009,SIEMENS SYNGO INDEX SERVICE,71)	Study Archived	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,72)	Study Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,73)	Series Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,74)	Instance Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,75)	Study Corrected	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,76)	Study Marked	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,77)	Review	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,78)	Isotope Module Level	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,79)	Radionuclide Total Dose on Series level	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,7A)	Radionuclide Total Dose on Instance level	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,7B)	Series Radiopharmaceutical Information Sequence	SQ	1

DICOM Tag	Name	VR	VM
(0009,SIEMENS SYNGO INDEX SERVICE,7C)	Instance Radiopharmaceutical Information Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,80)	Workflow Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,81)	Patient's Name Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,82)	Other Patient Names Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,83)	Name of Physician(s) Reading Study Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,84)	Requesting Physician Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,85)	Referring Physician's Name Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,86)	Performing Physician's Name Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,87)	Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,88)	Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,89)	Middle Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8A)	Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8B)	Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8C)	Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8D)	Ideographic Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8E)	Ideographic Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8F)	Ideographic Middle Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,90)	Ideographic Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,91)	Ideographic Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,92)	Ideographic Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,93)	Phonetic Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,94)	Phonetic Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,95)	Phonetic Middle Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,96)	Phonetic Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,97)	Phonetic Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,98)	Phonetic Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,99)	Study Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9A)	Series Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9B)	Instance Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9C)	User Specified Worklist	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,9D)	User Specified Worklist Study Registration Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,9E)	User Specified Worklist Study Registration User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,9F)	User Specified Worklist Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,A0)	Sender System Device Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,A1)	Instance Repetition Time	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,A2)	Instance Effective Echo Time	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A3)	Instance Inversion Times	FD	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,A4)	Instance Nominal Cardiac Trigger Delay Time	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A5)	Instance Diffusion b-value	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A6)	Instance Creator Entity	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,A7)	Data Source	AE	1
(0009,SIEMENS SYNGO INDEX SERVICE,A8)	Study Availability	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,AC)	Detector View Code Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,AD)	Detector Information Code Value	SH	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,AE)	Detector Information Code Meaning	LO	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,AF)	Detector Information Coding Scheme Designator	SH	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,B0)	Relevant Body Part Examined	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,B1)	Relevant Protocol Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,B2)	Relevant Modality	CS	1
(0009,SIEMENS SYNGO INSTANCE MANIFEST,00)	Temporary Original Header Sequence	SQ	1
(0009,SIEMENS SYNGO INSTANCE MANIFEST,10)	syngo Index Source AE Title	AE	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,02)	Hanging Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,06)	Data Sharing Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,08)	Bagging Operations Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,10)	Synchronization Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,12)	Custom Filter Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,14)	Custom Sorter Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,20)	Selector DT Value	DT	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,22)	Selector DA Value	DA	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,24)	Selector TM Value	TM	1-n

DICOM Tag	Name	VR	VM
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,26)	Selector UI Value	UI	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,30)	Custom Property Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,32)	Custom Property Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,34)	Custom Property Name	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,36)	Custom Property Value	LT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,38)	Layout Property Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,40)	Synchronization Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,60)	Viewport Definitions Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,62)	Protocol Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,70)	Display Protocol Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,72)	Display Protocol Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,74)	Display Protocol Level	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,76)	Display Protocol Creator	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,78)	Display Protocol Creation Datetime	DT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7A)	Referenced Data Protocol	UI	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7B)	Original Display Protocol	UI	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7C)	Display Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7E)	Layout Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,80)	Layout Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,82)	Layout Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,84)	Segment Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,86)	Segment Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,88)	Segment Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8A)	Segment Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8C)	Tile Horizontal Dimension	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8E)	Tile Vertical Dimension	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,90)	Fill Order	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,92)	Segment Small Scroll Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,94)	Segment Small Scroll Amount	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,96)	Segment Large Scroll Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,98)	Segment Large Scroll Amount	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9A)	Segment Overlap Priority	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9C)	Data Role View Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9E)	Data Role View Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A2)	Referenced Data Role	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A4)	Sharing Enabled	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A8)	Referenced Data Role Views	US	2-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B0)	Data Protocol Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B2)	Data Protocol Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B4)	Data Protocol Level	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B6)	Data Protocol Creator	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B8)	Data Protocol Creation Datetime	DT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BA)	Data Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BC)	Data Protocol Definition Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BE)	Data Role Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C0)	Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C2)	Data Role Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C4)	IsSystem	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C6)	Selector Operations Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C8)	Selector Usage Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CA)	Select by Attribute Presence	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CC)	Select by Category	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CE)	Select by Operator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D0)	Custom Selector Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D2)	Selector Operator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D4)	Reformatting Required	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D6)	Registration Data Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D8)	Reference Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DA)	Model Data Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DC)	Model Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DE)	Fusion Display Sequence	SQ	1

DICOM Tag	Name	VR	VM
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E0)	Transparency	FD	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E2)	Time Point	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E4)	First Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E6)	Last Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E8)	Intermediate Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EA)	Data Processor Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EC)	Data Processor Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EE)	Template Data Role Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F0)	View Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F4)	View Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F6)	Custom Bagging Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F8)	Referenced Display Segment Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FA)	Data Role Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,46)	Internal Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FC)	Unassigned Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FE)	Initial Display Scroll Position	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,04)	Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,16)	Reference Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,18)	Model Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,28)	Referenced Template Data Role	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,42)	Presentation Creator Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,44)	Cine Navigation Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,48)	Semantic Naming Strategy	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,50)	Parameter String	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,52)	Sorting Order	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,54)	syngo Template Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,56)	Sorter Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,58)	Data Display Protocol Version	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,64)	TemplateSelectorSequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,66)	DefaultTemplate	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,68)	IsPreferred	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,6A)	TimepointInitialValueSequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,6C)	TimepointVariable	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5A)	TimepointValue	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5B)	SharingGroupSequence	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5C)	TemplateSelectorOperator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5D)	SharingType	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FF)	VRT Preset	LO	1
(0029,SIEMENS SYNGO MODULES,51)	Incomplete Frame	CS	1
(0029,SIEMENS SYNGO MODULES,52)	Presentation UserData	UT	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,00)	syngo Graphic Object Sequence	SQ	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,01)	Fill Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,02)	Fill Background Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,03)	Fill Foreground Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,04)	Siemens Fill Mode	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,05)	Siemens Fill Pattern	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,06)	Line Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,07)	Line Background Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,08)	Line Foreground Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,09)	Line Type	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,10)	Siemens Line Thickness	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,11)	Line Shadow X Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,12)	Line Shadow Y Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,13)	Siemens Shadow Style	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,14)	Shadow Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,15)	Stipple Pattern	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,16)	Line Anti Aliasing	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,17)	Line-Z-Blend Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,18)	Text Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,19)	Text Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1A)	Connection Line Width Selected	DS	1

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1B)	Connection Line Stipple Pattern	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1C)	Connection Line Width	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,20)	Text Horizontal Align	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,21)	Text Vertical Align	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,22)	Text Shadow X Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,23)	Text Shadow Y Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,24)	Text Shadow Style	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,25)	Text Shadow Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,26)	Text Log Font	CS	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,27)	Text-Z-Blend Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,28)	syngo Graphic Bit Mask	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,29)	Visibility Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,30)	syngo Graphic Sensitivity	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,31)	syngo Graphic Pick Mode Type	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,32)	syngo Graphic Layer	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,33)	syngo Graphic Object Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,34)	syngo Graphic Coordinate System	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,35)	syngo Graphic Custom Attributes	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,36)	syngo Graphic Custom Attributes Key	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,37)	syngo Graphic Custom Attributes Value	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,38)	syngo Graphic View Name	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,39)	syngo Graphic Data	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,40)	syngo Graphic Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,41)	Number of syngo Graphic Points	US	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,42)	Axis Main Tick Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,43)	Axis Detail Tick Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,44)	Axis Main Tick Spacing	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,45)	Axis Detail Tick Spacing	DS	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,46)	Axis Main Tick Count	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,47)	Axis Detail Tick Count	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,48)	Axis Tick Behavior	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,49)	Axis Tick Alignment	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,50)	Axis Step	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,51)	Axis Step Index	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,52)	Axis Text Format	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,53)	Axis Show Center Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,54)	Axis Show Tick Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,55)	Bitmap X Orientation	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,56)	Bitmap Y Orientation	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,57)	syngo Graphic Blob	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,58)	syngo Graphic Interpolation	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,59)	syngo Graphic Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,60)	syngo Graphic Size	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,61)	Cut Line Side	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,62)	syngo Graphic Tip Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,63)	Cut Line Arrow Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,64)	Line Gap Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,65)	syngo Graphic Circle Radius	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,66)	Line Distance Move	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,67)	Line Marker Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,68)	syngo Graphic Center	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,69)	Range Center Area Top Left	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,70)	Range Center Area Bottom Right	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,71)	Range Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,72)	Range Minimum Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,73)	Range Maximum Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,74)	syngo Graphic Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,75)	Range Minimum Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,76)	Range Maximum Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,77)	syngo Graphic Height	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,78)	Range Feed	DS	1

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,79)	Range Direction	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,80)	Range Show Scans	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,81)	Range Minimum Scan Distance	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,82)	Range Orthogonal Height	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,83)	syngo Graphic Position	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,84)	syngo Graphic Closed Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,85)	Range Line Tip Mode	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,86)	syngo Graphic List Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,87)	Axis Flip Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,88)	Curve Diagram Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,89)	syngo Graphic Start Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,90)	syngo Graphic End Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,91)	Live Wire Smoothness	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,92)	Live Wire Spline Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,93)	Ellipse Circle Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,94)	syngo Graphic Square Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,95)	Curve Section Start Index	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,96)	Curve Section End Index	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,97)	Marker Alpha	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,98)	Table Row Count	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,99)	Table Column Count	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9A)	Table Row Height	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9B)	Table Column Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9C)	Rectangle Selection Segment Offset	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9D)	syngo Graphic Text	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A0)	Axis Tick Spacing Coordinate System	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A1)	Axis Diagram Grid Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A2)	Polar Plot Circle Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A3)	Polar Plot Lines-per-Circle	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A4)	Polar Plot Compartment Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A5)	Polar Plot Radius Weight	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A6)	Circle Segment Outer Radius	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A7)	Circle Segment Clockwise Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A8)	Axis Diagram Auto Resize Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A9)	Axis Diagram Step Start	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B0)	Group Root	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B1)	Group Name	ST	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B2)	syngo Graphic Annotation Sequence	SQ	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B3)	Text Minimum Height	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B4)	Text Font Scaling Factor	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B5)	Text Maximum Extensions	SL	2
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B6)	Text Segment Size	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B7)	Graphic Object Reference Label	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,C4)	Show Grid	CS	1
(0029,SIEMENS SYNGO PRINT SERVICE,10)	Sheet Number	IS	1
(0071,SIEMENS SYNGO REGISTRATION,20)	Registered Image Sequence	SQ	1
(0071,SIEMENS SYNGO REGISTRATION,21)	Registration Is Validated Flag	CS	1
(0071,SIEMENS SYNGO REGISTRATION,22)	Deformable Registration Inverse Grid Sequence	SQ	1
(0029,SIEMENS SYNGO RWVM,50)	RWVM Version	LO	1
(0029,SIEMENS SYNGO SEGMENTATION,10)	Segmentation Inverted	CS	1
(0029,SIEMENS SYNGO SEGMENTATION,11)	Segmentation Uneditable by User	CS	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,12)	Surface Mesh Private Data	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,13)	Surface Mesh Private Data Task name	CS	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,14)	Surface Mesh Private Data Version Number	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,15)	Surface Mesh ImagePlane Sequence	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,16)	ImagePlane Sequence Identifier	LO	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,17)	ImagePlane Sequence Identification Code Sequence	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,18)	ImagePlane Sequence Identification Code Value	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,19)	ImagePlane Sequence Identification Coding Scheme Designator	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,20)	ImagePlane Sequence Identification Code Meaning	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,21)	Surface Mesh ImagePlane	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,22)	ImagePlane	FL	9
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,23)	ImagePlane Type	CS	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,24)	ImagePlane Description	LO	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,25)	Surface Mesh Point List Sequence	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,26)	Point List Identifier	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,27)	Point List Identification Code Sequence	SQ	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,28)	Point List Identification Code Value	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,29)	Point List Identification Coding Scheme Designator	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,30)	Point List Identification Code Meaning	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,31)	Point List Description	LO	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,32)	Point List	FL	1-N
(0031,SIEMENS SYNGO SOP CLASS PACKING,10)	SOP Class Packing Sequence	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,20)	Packing Version	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,21)	Packing Originator	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,30)	Original SOP Class UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,31)	Original Study Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,32)	Original Series Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,33)	Original SOP Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,34)	Original Transfer Syntax UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,40)	Attributes to Set to zero-length	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,41)	Attributes to Remove	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,50)	Original Rows	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,51)	Original Columns	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,58)	Original Image Type	CS	2-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,60)	Original Modality	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,70)	Sequence of original stream chunks	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,71)	Start tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,72)	End tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,73)	Stream chunk is a PAYLOAD	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,80)	Stream chunk	OB	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,10)	SOP Class Packing Sequence	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,20)	Packing Version	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,21)	Packing Originator	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,30)	Original SOP Class UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,31)	Original Study Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,32)	Original Series Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,33)	Original SOP Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,34)	Original Transfer Syntax UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,40)	Attributes to Set to zero-length	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,41)	Attributes to Remove	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,50)	Original Rows	US	1

DICOM Tag	Name	VR	VM
(0031,SIEMENS SYNGO SOP CLASS PACKING,51)	Original Columns	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,58)	Original Image Type	CS	2-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,60)	Original Modality	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,70)	Sequence of original stream chunks	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,71)	Start tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,72)	End tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,73)	Stream chunk is a PAYLOAD	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,80)	Stream chunk	OB	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,01)	Time Point ID	LO	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,02)	Time Point Information	LO	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,50)	Studies in Time Point Sequence	SQ	1
(0029,SIEMENS SYNGO VOLUME,12)	Slices	US	1
(0029,SIEMENS SYNGO VOLUME,18)	Volume Level	IS	1
(0029,SIEMENS SYNGO VOLUME,30)	Voxel Spacing	DS	3
(0029,SIEMENS SYNGO VOLUME,32)	Volume Position (Patient)	DS	3
(0029,SIEMENS SYNGO VOLUME,37)	Volume Orientation (Patient)	DS	9
(0029,SIEMENS SYNGO VOLUME,40)	Resampling Flag	CS	1
(0029,SIEMENS SYNGO VOLUME,42)	Normalization Flag	CS	1
(0029,SIEMENS SYNGO VOLUME,44)	SubVolume Sequence	SQ	1
(0029,SIEMENS SYNGO VOLUME,46)	Histogram Number Of Bins UL	UL	1
(0029,SIEMENS SYNGO VOLUME,47)	Volume Histogram Data	OB	1
(0029,SIEMENS SYNGO VOLUME,48)	Volume Histogram BinBase	SL	1
(0029,SIEMENS SYNGO VOLUME,50)	Volume Version	LO	1
(0029,SIEMENS SYNGO VOLUME,60)	Total Frame Count Of Referenced Instance	IS	0-1
(0031,SIEMENS SYNGO WORKFLOW,10)	WF Internal Patient UID	UI	1
(0031,SIEMENS SYNGO WORKFLOW,11)	WF Patients Death Indicator	SH	1
(0031,SIEMENS SYNGO WORKFLOW,12)	WF Patients Death Date	DA	1
(0031,SIEMENS SYNGO WORKFLOW,13)	WF Patients Death Time	TM	1
(0031,SIEMENS SYNGO WORKFLOW,14)	WF VIP Indicator	SH	1
(0031,SIEMENS SYNGO WORKFLOW,15)	WF Emergency Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,16)	Source	US	1
(0031,SIEMENS SYNGO WORKFLOW,20)	WF Internal Visit UID	SH	1
(0031,SIEMENS SYNGO WORKFLOW,25)	WF Internal ISR UID	SH	1
(0031,SIEMENS SYNGO WORKFLOW,32)	WF Control State	SH	1
(0031,SIEMENS SYNGO WORKFLOW,34)	WF Local Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,36)	WF Referenced Studies	UI	1-n
(0031,SIEMENS SYNGO WORKFLOW,40)	WF Workflow ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,41)	WF Workflow Description	LO	1
(0031,SIEMENS SYNGO WORKFLOW,42)	WF Workflow Control State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,43)	WF Workflow Ad Hoc Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,44)	WF Hybrid Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,45)	WF Workflow Read State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,50)	WF Workitem ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,51)	WF Workitem Name	LO	1
(0031,SIEMENS SYNGO WORKFLOW,52)	WF Workitem Type	LO	1
(0031,SIEMENS SYNGO WORKFLOW,53)	WF Workitem Roles	LO	1-n
(0031,SIEMENS SYNGO WORKFLOW,54)	WF Workitem Description	LO	1
(0031,SIEMENS SYNGO WORKFLOW,55)	WF Workitem Control State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,56)	WF Claiming User	LO	1
(0031,SIEMENS SYNGO WORKFLOW,57)	WF Claiming Host	LO	1
(0031,SIEMENS SYNGO WORKFLOW,58)	WF Taskflow ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,59)	WF Taskflow Name	LO	1
(0031,SIEMENS SYNGO WORKFLOW,5A)	WF Failed Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5B)	WF Scheduled Time	DT	1
(0031,SIEMENS SYNGO WORKFLOW,5C)	WF Workitem Ad Hoc Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5D)	WF Patient Update Pending Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5E)	WF Patient Mixup Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,60)	WF Client ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,61)	WF Template ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,70)	WF E-mail	LO	1
(0031,SIEMENS SYNGO WORKFLOW,81)	WF Institution Name	LO	1

DICOM Tag	Name	VR	VM
(0031,SIEMENS SYNGO WORKFLOW,82)	WF Institution Address	ST	1
(0031,SIEMENS SYNGO WORKFLOW,83)	WF Institution Code Sequence	SQ	1
(0031,SIEMENS SYNGO WORKFLOW,90)	WF Issuer of Master Patient ID	UI	1
(0031,SIEMENS SYNGO WORKFLOW,A0)	Patient History Sequence	SQ	1
(0031,SIEMENS SYNGO WORKFLOW,A1)	Procedure Marked Deleted Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,A2)	ContextfolderId	LT	1
(0031,SIEMENS SYNGO WORKFLOW,A3)	Visible DataRoles	UT	1
(0031,SIEMENS SYNGO WORKFLOW,A4)	Preloaded	US	1
(0031,SIEMENS SYNGO WORKFLOW,A5)	TaskflowTechnology	SL	1
(0031,SIEMENS SYNGO WORKFLOW,A6)	WfWorkflowType	SH	1
(0031,SIEMENS SYNGO WORKFLOW,A7)	NumberOfRequestedProcedures	SL	1
(0031,SIEMENS SYNGO WORKFLOW,A8)	External Master Patient ID	LT	1
(0031,SIEMENS SYNGO WORKFLOW,A9)	Not To Be Archived	US	1
(0031,SIEMENS SYNGO WORKFLOW,B0)	WorklistItemCheckSum	ST	1
(0067,SIEMENS MED MI,01)	MI Scan ID	LT	1
(0067,SIEMENS MED MI,02)	Scanner Console Generation	LO	1
(0067,SIEMENS MED MI,03)	Recon Parameters	OB	1
(0067,SIEMENS MED MI,04)	Group Reconstruction ID	LO	1
(0067,SIEMENS MED MI,05)	Device IVK	ST	1
(0067,SIEMENS MED MI,14)	Raw Data Description	LO	1
(0067,SIEMENS MED MI,16)	Raw Data Series instance UIDs	UI	1
(0067,SIEMENS MED MI,17)	Raw Data Referenced Series instance UIDs	UI	1
(0067,SIEMENS MED MI,18)	Raw Data Blob Sequence	SQ	1
(0071,SIEMENS MED PT,21)	Reference To Registration	LO	1
(0071,SIEMENS MED PT,22)	Decay Correction DateTime	DT	1
(0071,SIEMENS MED PT,23)	Registration Matrix	FD	16
(0071,SIEMENS MED PT,24)	Table Motion	CS	1
(0071,SIEMENS MED PT,25)	Lumped Constant	FD	1
(0071,SIEMENS MED PT,26)	Histogramming Method	CS	1
(0071, SIEMENS MED PT MU MAP, 01)	SOP Class of Source	UI	1
(0071, SIEMENS MED PT MU MAP, 02)	Related Mu Map Series	UI	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 00)	AX SSO SURFACE TYPE	CS	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 04)	AX SSO VERSION NUMBER	US	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 39)	AX SSO SURFACE VERSION NUMBER	US	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 40)	AX SSO OWNER	LO	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 42)	AX SSO SURFACE GUID	LO	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 43)	AX SSO SEMENT GROUP GUID	LO	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 44)	AX SSO GUID	LO	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 47)	AX SSO SEG GROUP SEQUENCE	SQ	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 48)	AX SSO SURFACE SEGMENTATION SEQUENCE	SQ	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 49)	AX SSO SEG GROUP NAME	LO	1
(0067, SIEMENS SMS-AX Surface Segmentation Extensions, 51)	AX SSO REFERENCED SEG GROUP GUID	LO	1
(0067, SIEMENS SMS-CTH Needle Data, 52)	CTH NEEDLE DATA	OB	1
(0019, SIEMENS CT EXAM APP SHARED , 02)	Reference mAs	UL	1
(0019, SIEMENS CT EXAM APP SHARED , 03)	Physicists Line	LO	1
(0029, SIEMENS CT EXAM IMAGE , 06)	Cardio Scan Duration	UL	1
(0029, SIEMENS CT EXAM IMAGE , 07)	Kernel Content Version	UL	1
(0029, SIEMENS CT EXAM IMAGE , 0D)	Flying Focal Spot	LO	1
(0029, SIEMENS CT EXAM EQUIPMENT ,04)	Detector center	SL	1
(0029, SIEMENS CT EXAM EQUIPMENT ,06)	Detector Spacing	FD	1

DICOM Tag	Name	VR	VM
(0029, SIEMENS CT EXAM EQUIPMENT ,09)	Model Type	LT	1
(0029,SIEMENS CT APPL ALG PARAMS,30)	SkullUnfolding RenderInfo	OB	1

Interpretation of the DICOM Tags from the above table:
(<odd group number>, <private creator identification code>, <private element>)

9.3 Coded Terminology and Templates

9.3.1 Context Groups

N/A

9.3.2 Template Specifications

syngo CT VB10A creates and stores, upon completion of the procedure step, a DICOM CT Radiation Dose SR object. The CT Radiation Dose SR uses template TID 10011. The Examination Report uses a proprietary template.

9.3.2.1 CT Radiation Dose SR

Table 168: CT Radiation Dose (TID 10011)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	X-Ray Radiation Dose Structured Report	1	ALWAYS	Root node
>	HAS CONCEPT MOD	CODE	Procedure reported	1	ALWAYS	Computed Tomography X-Ray
>>	HAS CONCEPT MOD	CODE	Has Intent	1	ALWAYS	Diagnostic Intent
>		INCLUDE	Observer Context (TID 1002)	1-n	ALWAYS	
>	HAS OBS CONTEXT	DATETIME	Start of X-Ray Irradiation	1	ALWAYS	First Acquisition Date/Time in study
>	HAS OBS CONTEXT	DATETIME	End of X-Ray Irradiation	1	ALWAYS	Last Acquisition Date/Time in study
>	HAS OBS CONTEXT	CODE	Scope of Accumulation	1	ALWAYS	Study
>>	HAS PROPERTIES	UIDREF	UID Types	1	ALWAYS	Study Instance UID (0020,000D)
>	CONTAINS	INCLUDE	CT Accumulated Dose Data	1	ALWAYS	TID 10012
>	CONTAINS	INCLUDE	CT Irradiation Event Data	1-n	ALWAYS	TID 10013
>	CONTAINS	CODE	Source of Dose Information	1-n	ALWAYS	

Table 169: Observer Context (TID 1002, with includes from TID 1004)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
	HAS OBS CONTEXT	CODE	Observer Type	1	ALWAYS	
>	HAS OBS CONTEXT	UIDREF	Device Observer UID	1	ALWAYS	
>	HAS OBS CONTEXT	TEXT	Device Observer Name	1	ALWAYS	Name of syngo Acquistion Workplace
>	HAS OBS CONTEXT	TEXT	Device Observer Manufacturer	1	ALWAYS	“Siemens Healthineers”
>	HAS OBS CONTEXT	TEXT	Device Observer Model Name	1	ALWAYS	Scanner model
>	HAS OBS CONTEXT	TEXT	Device Observer Serial Number	1	ALWAYS	Individual serial number
>	HAS OBS CONTEXT	TEXT	Device Observer Physical Location During Observation	1	ALWAYS	

Table 170: CT Accumulated Dose Data (TID 10012)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	CT Accumulated Dose Data	1	ALWAYS	
>	CONTAINS	NUM	Total Number of Irradiation Events	1	ALWAYS	
>	CONTAINS	NUM	CT Dose Length Product Total	1	ALWAYS	

Table 171: CT Irradiation Event Data (TID 10013)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	CT Acquisition	1	ALWAYS	
>	CONTAINS	TEXT	Acquisition Protocol	1	ALWAYS	Name of the Range
>	CONTAINS	CODE	Target Region	1	ALWAYS	
>	CONTAINS	CODE	CT Acquisition Type	1	ALWAYS	
>	CONTAINS	CODE	Procedure Context	1	ALWAYS	
>	CONTAINS	UIDREF	Irradiation Event UID	1	ALWAYS	
>	CONTAINS	CONTAINER	CT Acquisition Parameters	1	ALWAYS	
>>	CONTAINS	NUM	Exposure Time	1	ALWAYS	
>>	CONTAINS	INCLUDE	Scanning Length (TID 10014)	1	ALWAYS	
>>	CONTAINS	NUM	Nominal Single Collimation Width	1	ALWAYS	
>>	CONTAINS	NUM	Nominal Total Collimation Width	1	ALWAYS	
>>	CONTAINS	NUM	Pitch Factor	1	VNAP	
>>	CONTAINS	NUM	Number of X-Ray Sources	1	ALWAYS	
>>	CONTAINS	CONTAINER	CT X-Ray Source Parameters	1-n	ALWAYS	
>>>	CONTAINS	TEXT	Identification of the X-Ray Source	1	ALWAYS	
>>>	CONTAINS	NUM	KVP	1	ALWAYS	
>>>	CONTAINS	NUM	Maximum X-Ray Tube Current	1	ALWAYS	
>>>	CONTAINS	NUM	X-Ray Tube Current	1	ALWAYS	
>>>	CONTAINS	NUM	Exposure Time per Rotation	1	VNAP	
>	CONTAINS	CONTAINER	CT Dose	1	ALWAYS	
>>	CONTAINS	NUM	Mean CTDIvol	1	ALWAYS	
>>	CONTAINS	CODE	CTDIw Phantom Type	1	ALWAYS	
>>	CONTAINS	NUM	DLP	1	ALWAYS	
>>	CONTAINS	NUM	Size Specific Dose Estimate	1	ALWAYS	
>>>	HAS CONCEPT MOD	CODE	Measurement Method	1-n	ALWAYS	Arithmetic Average of SSDE(z)
>>>	CONTAINS	NUM	Water Equivalent Diameter	1	ALWAYS	
>>>>	HAS CONCEPT MOD	CODE	Measurement Method	1	ALWAYS	Water Equivalent Diameter From Localizer
>>>	INFERRED FROM	NUM	Size Specific Dose Estimate At Longitudinal Position z	1-n	ALWAYS	
>>>>	INFERRED FROM	NUM	Longitudinal Position Z	1	ALWAYS	
>>>	INFERRED FROM	NUM	Water Equivalent Diameter At	1	ALWAYS	

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
			Longitudinal Position Z			
>>	CONTAINS	INCLUDE	CT DOSE Check Details (TID 10015)		ALWAYS	

Table 172: Scanning Length (TID 10014)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		NUM	Scanning Length	1	ALWAYS	
		NUM	Length of Reconstructable Volume	1	ALWAYS	
		NUM	Exposed Range	1	ALWAYS	
		NUM	Top Z Location of Reconstructable Volume	1	ALWAYS	
		NUM	Bottom Z Location of Reconstructable Volume	1	ALWAYS	
		NUM	Top Z Location of Scanning Length	1	ALWAYS	
		NUM	Bottom Z Location of Scanning Length	1	ALWAYS	
		UIDREF	Frame of Reference UID	1	ALWAYS	

Table 173: CT Dose Check Details (TID 10015)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	Dose Check Alert Details	1	VNAP	Only if Dose Alert is configured
>	CONTAINS	CODE	DLP Alert Value Configured	1	ALWAYS	
>	CONTAINS	CODE	CTDIvol Alert Value Configured	1	ALWAYS	
>	CONTAINS	NUM	DLP Alert Value	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Alert Value	1	ALWAYS	
>	CONTAINS	NUM	Accumulated DLP Forward Estimate	1	ALWAYS	
>	CONTAINS	NUM	Accumulated CTDIvol Forward Estimate	1	ALWAYS	
>	CONTAINS	TEXT	Reason for Proceeding	1	ALWAYS	
>	CONTAINS	INCLUDE	Person Participant (TID 1020)	1	ALWAYS	
		CONTAINER	Dose Check Notification Details	1	VNAP	Only if Dose Notification is configured
>	CONTAINS	CODE	DLP Notification Value Configured	1	ALWAYS	
>	CONTAINS	CODE	CTDIvol Notification Value Configured	1	ALWAYS	
>	CONTAINS	NUM	DLP Notification Value	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Notification Value	1	ALWAYS	
>	CONTAINS	NUM	DLP Forward Estimate	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Forward Estimate	1	ALWAYS	
>	CONTAINS	TEXT	Reason for Proceeding	1	ALWAYS	
>	CONTAINS	INCLUDE	Person Participant (TID 1020)	1	ALWAYS	

Table 174: Person Participant (TID 1020)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		PNAME	Person Name	1	ALWAYS	
>	HAS PROPERTIES	CODE	Person Role in Procedure	1	ALWAYS	

Table 175: Device Participant (TID 1021)

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CODE	Device Role in Procedure	1	ALWAYS	
>	HAS PROPERTIES	TEXT	Device Manufacturer	1	ALWAYS	"Siemens Healthineers"
>	HAS PROPERTIES	TEXT	Device Model Name	1	ALWAYS	
>	HAS PROPERTIES	TEXT	Device Serial Number	1	ALWAYS	
>	HAS PROPERTIES	UIDREF	Device Observer UID	1	ALWAYS	

9.3.2.2 CT Examination SR

Table 176: CT Examination SR

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	EV(1, 99CT_SOMX, "CT Examination Report")	1	ALWAYS	
>	CONTAINS	CONTAINER	EV(2, 99CT_SOMX, "CT Acquisition Report")	1	ALWAYS	
>>	CONTAINS	NUM	EV(100, 99CT_SOMX, "Total mAs")	1	ALWAYS	UNITS = EV (mA.s, UCUM, "mA.s")
>>	CONTAINS	TEXT	EV(102, 99CT_SOMX, "Performing Physician's Name")	1	ALWAYS	
>>	CONTAINS	TEXT	EV(103, 99CT_SOMX, "Operators Name")	1	ALWAYS	
>>	CONTAINS	NUM	EV(113813, DCM, "CT Dose Length Product Total")	1	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")
>>	CONTAINS	CONTAINER	EV(600, 99CT_SOMX, "Patient Position Attributes")	1-n	ALWAYS	
>>>	CONTAINS	TEXT	EV(601, 99CT_SOMX, "Patient Position")	1	ALWAYS	
>>>	CONTAINS	TEXT	EV(602, 99CT_SOMX, "Frame of reference id")	1	ALWAYS	
>>	CONTAINS	CONTAINER	EV(550, 99CT_SOMX, "Contrast Phase")	1-n	ANAP	
>>>	CONTAINS	TEXT	EV(121145, DCM, "Description of Material")	1	ALWAYS	
>>>	CONTAINS	NUM	EV(122091, DCM, "Volume administered")	1	ALWAYS	UNITS = EV (ml, UCUM, "ml")
>>>	CONTAINS	NUM	EV(122093, DCM, "Concentration")	1	ALWAYS	UNITS = EV (mg/ml, UCUM, "mg/ml")
>>>	CONTAINS	NUM	EV(122094, DCM, "Rate of administration")	1	ALWAYS	

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
>>>	CONTAINS	NUM	EV(300, 99CT_SOMX, “CM Ratio”)	1	ALWAYS	UNITS = EV (%, UCUM, "%")
>>>	CONTAINS	TEXT	EV (123011, DCM, "" Contrast/Bolus Agent)	1	ALWAYS	
>>	CONTAINS	CONTAINER	EV(113819, DCM, “CT Acquisition”)	1	ALWAYS	
>>>	CONTAINS	TEXT	EV(101, 99CT_SOMX, “Range Name”)	1-n	ALWAYS	
>>>	CONTAINS	CONTAINER	EV(4, 99CT_SOMX, “Decision Tree”	1	ALWAYS	
>>>>	CONTAINS	TEXT	EV(803, 99CT_SOMX, “Comment”	1	ANAP	“No decision tree selected”
>>>>	CONTAINS	CONTAINER	EV(5, 99CT_SOMX, “User”	1	ANAP	
>>>>	CONTAINS	CONTAINER	EV(800, 99CT_SOMX, “Attribute”	1-n	ALWAYS	
	CONTAINS	TEXT	EV(801, 99CT_SOMX, “Question”	1	ALWAYS	
>>>>>>	CONTAINS	TEXT	EV(802, 99CT_SOMX, “Answer”	1	ALWAYS	
>>>>	CONTAINS	CONTAINER	EV(6, 99CT_SOMX, “System”	1	ANAP	
>>>>>	CONTAINS	CONTAINER	EV(800, 99CT_SOMX, “Attribute”	1-n	ALWAYS	
>>>>>>	CONTAINS	TEXT	EV(801, 99CT_SOMX, “Question”	1	ALWAYS	
>>>>>>	CONTAINS	TEXT	EV(802, 99CT_SOMX, “Answer”	1	ALWAYS	
>>>	CONTAINS	CONTAINER	EV(113822, DCM, “CT Acquisition Parameters”)	1-n	ALWAYS	
>>>>	CONTAINS	NUM	EV(113824, DCM, "Exposure Time")	1	ALWAYS	UNITS = EV (s, UCUM, "s")
>>>>	CONTAINS	NUM	EV(113826, DCM, "Nominal Single Collimation Width")	1	ALWAYS	UNITS = EV (mm, UCUM, "mm")
>>>>	CONTAINS	NUM	EV(204, 99CT_SOMX, “Quality Reference mAs”)	1		UNITS = EV (mA.s, UCUM, "mA.s")
>>>>	CONTAINS	NUM	EV(205, 99CT_SOMX, “Quality Reference mAs Low”)	1		UNITS = EV (mA.s, UCUM, "mA.s")
>>>>	CONTAINS	NUM	EV(206, 99CT_SOMX, “Quality Reference mAs High”)	1		UNITS = EV (mA.s, UCUM, "mA.s")
>>>>	CONTAINS	NUM	EV(207, 99CT_SOMX, “Effective mAs”)	1-n		UNITS = EV (mA.s, UCUM, "mA.s")
>>>>	CONTAINS	NUM	EV(208, 99CT_SOMX, “Effective mAs Low”)	1-n		UNITS = EV (mA.s, UCUM, "mA.s")

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
>>>>	CONTAINS	NUM	EV(209, 99CT_SOMX, “Effective mAs High”)	1-n		UNITS = EV (mA.s, UCUM, "mA.s")
>>>>	CONTAINS	NUM	EV(113830, DCM, "Mean CTDIvol")	1	ALWAYS	UNITS = EV (mGy, UCUM, "mGy")
>>>>	CONTAINS	TEXT	EV(113835, DCM, "CTDIw Phantom Type")	1	ALWAYS	
>>>>	CONTAINS	NUM	EV(113838, DCM, "DLP")	1	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")
>>>>	CONTAINS	NUM	EV(113930, DCM, "Size Specific Dose Estimate")	1		UNITS = EV (mGy, UCUM, "mGy ")
>>>>	CONTAINS	NUM	EV(113980, DCM, "Water Equivalent Diameter")	1		UNITS = EV (cm, UCUM, "cm ")
>>>>	CONTAINS	NUM	EV(113812, DCM, "Total Number of Irradiation events")	1	ALWAYS	UNITS = EV ({events},UCUM, "events")
>>>>	CONTAINER	CONTAINER	EV(113831, DCM, "CT X-Ray Source Parameters")	1-n	ALWAYS	
>>>>>	CONTAINS	NUM	EV (113733, DCM, "KVP")	1	ALWAYS	UNITS = EV (kV, UCUM, "kV")
>>>>>	CONTAINS	NUM	EV (113734, DCM, "X-Ray Tube Current")	1	ANAP	UNITS = EV (mA, UCUM, "mA")
>>>>>	CONTAINS	NUM	EV (113736, DCM, "Exposure")	1	ANAP	UNITS = EV (mA.s, UCUM, "mA.s")
>>>>>	CONTAINS	NUM	EV(200, 99CT_SOMX, “Effective Exposure”)	1	ANAP	UNITS = EV (mA.s, UCUM, "mA.s")
>>>>>	CONTAINS	TEXT	EV (113832, DCM, "Identification of the X-Ray Source")	1	ALWAYS	
>>>>>	CONTAINS	TEXT	EV(201, 99CT_SOMX, “Tin Filter”)	1	ALWAYS	
>>>>>	CONTAINS	TEXT	EV(202, 99CT_SOMX, “Tube Type”)	1	ALWAYS	A, B
>>>>>	CONTAINS	TEXT	EV(203, 99CT_SOMX, “Scan Number”)	1	ALWAYS	
>>>>>	CONTAINS	NUM	EV(113826, DCM, "Nominal Single Collimation Width")	1	ALWAYS	UNITS = EV (mm, UCUM, "mm")
>>>>>	CONTAINS	TEXT	EV(106, 99CT_SOMX, "X-Ray Filter Material")	1	ALWAYS	None, Tin, GoldTin, Gold
>>>>	CONTAINS	NUM	EV(107, 99CT_SOMX, “Effective Bolus Trigger Level”)	1	ANAP	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")
>>>>	CONTAINS	NUM	EV(108, 99CT_SOMX, “Reference Bolus Trigger Level”)	1	ANAP	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")
>>>>	CONTAINS	NUM	EV(109, 99CT_SOMX, “Intended Bolus Trigger Level”)	1	ANAP	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
>>>>	CONTAINS	CONTAINER	EV(110, 99CT_SOMX, "Enabled exposure pattern")	1	ANAP	
>>>>>	CONTAINS	TEXT	EV(111, 99CT_SOMX, "Dynamic Scan Cycle Time")	1-n	ANAP	

9.3.3 Private Code definitions

Table 177: Private Code definitions (Coding Scheme 99CT_SOMX)

Code Value	Code Meaning	Definition	Notes
1	CT Examination Report	Report for one CT examination	
2	CT Acquisition Report	Report for one CT acquisition	
3	Scanprotocols	Section for scan protocols within an CT examination	
4	Decision Tree	Clinical decision tree inside scan protocol	
5	User		
6	System		
100	Total mAs	Total mAs applied during one CT examination	
101	Range Name	Name of the range within a CT acquisition	
102	Performing Physician's Name	Name of the performing physician of a CT examination	
103	Operators Name	Name of the operator of a CT examination	
104	CARE kV IQ Level		
105	Rotation Time		
106	X-Ray Filter Material	Material of used X-Ray filter	
107	Effective Bolus Trigger Level	System calculated HU Level to start spiral scan as soon as the contrast medium in a vessel leads to a vessel enhancement	
108	Reference Bolus Trigger Level	HU Level related to 120 kV to start spiral scan as soon as the contrast medium in a vessel leads to a vessel enhancement	
109	Intended Bolus Trigger Level	User defined HU Level to start spiral scan as soon as the contrast medium in a vessel leads to a vessel enhancement	
110	Enabled exposure pattern		
111	Dynamic Scan Cycle Time		
200	Effective Exposure		
201	Tin Filter		

Code Value	Code Meaning	Definition	Notes
202	Tube Type		
203	Scan Number		
204	Quality Reference mAs		
205	Quality Reference Low		
206	Quality Reference High		
207	Effective mAs		
208	Effective mAs Low		
209	Effective mAs High		
300	CM Ratio	Ratio of the contrast medium	
500	Contrast	Section for contrast application	
550	Contrast Phase	Contrast phase indicator	
600	Patient Position Attributes	Section for patient positions	
601	Patient Position	Patient position within a Frame of Reference	
602	Frame of reference id	Unique identifier for a Frame of Reference	
800	Attribute		
801	Question		
802	Answer		
803	Comment		

9.4 Grayscale Image Consistency

The high resolution TFT display monitor option of syngo CT VB10A comes with a DICOM Grayscale Standard Display Function (GSDF) compliant factory pre-setting. A typical working environment setup is assumed for ambient light.

9.5 Standard Extended / Specialized / Private SOP Classes

9.5.1 Standard Extended / Specialized / Private SOP CT Image

The following table list the data dictionary of all DICOM IOD attributes where the DICOM standard definition of the CT Image SOP class is extended:

Table 178: Standard Extensions of CT Image

Attribute Name	Tag	Type	Notes
Image Type	(0008,0008)	1	See Image Type in the following sections for further explanation. 9.1.1.1.13.1 Image Type Values 9.1.1.1.13.2 Image Type Values for Multi-Energy (Supplement 188)
Rescale Type	(0028,1054)	1	See Rescale Type in the following sections for further explanation. 9.1.1.1.13.3 Rescale Type Values 9.1.1.1.13.4 Rescale Type Values for Multi-Energy (Supplement 188)

9.5.2 Standard Extended / Specialized / Private SOP Secondary Capture Image

The following table list the data dictionary of all DICOM IOD attributes where the DICOM standard definition of the Secondary Capture Image SOP class is extended:

Table 179: Standard Extensions of Secondary Capture Image

Attribute Name	Tag	Type	Notes
Slice Thickness	(0018,0050)	1	

9.5.3 Standard Extended / Specialized / Private SOP Segmentation

The following table list the data dictionary of all DICOM IOD attributes where the DICOM standard definition of the Segmentation SOP class is extended:

Table 180: Standard Extensions of Segmentation

Attribute Name	Tag	Type	Notes
Segmented Property Category Code Sequence	(0062,0003)	1	
Segmented Property Type Code Sequence	(0062,000f)	1	

9.6 Private Transfer Syntaxes

No private Transfer Syntaxes are defined for or requested by syngo CT VB10A DICOM application.

9.7 DICOM Print SCU – detailed status displays

The following tables document the behavior of the syngo CT VB10A DICOM Print AE in response to messages received for the printer SOP class and the print job SOP class.

Definitions of camera symbols:

- Idle: Camera is installed and ready; idle icon is displayed.
- Interact: The user has to react in near future, but not immediately.
  Example: A camera was low in 8x10 clear sheets: LOW 8x10 CLR was sent by N-EVENT-REPORT.
- Queue Stopped: The user has to react immediately. Either the camera needs immediate interaction or a job has been aborted.
  Example: A camera is out of 8x10 clear sheets, or camera is down, or a film job is aborted.

Note: different camera symbols are displayed according to the Printer Status Info.

9.7.1 Common Status Information

Table 181: Common Printer Status Information

Printer Status Info / Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI / 'camera symbol'
NORMAL	Camera is ready	Camera is ready	<None>/idle
BAD RECEIVE MGZ	There is a problem with the film receive magazine. Films from the printer cannot be transported into the magazine.	Problem with receive magazine.	<None>/interact
BAD SUPPLY MGZ	There is a problem with the film supply magazine. Films from this magazine cannot be transported into the printer.	Problem with supply magazine.	<None>/interact
CALIBRATING	Printer is performing self-calibration, it is expected to be available for normal operation shortly.	Self-calibration. Please wait.	<None>/idle
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.	Problem in calibration. Film quality may not be optimal.	<None>/interact
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.	Problem with chemistry. Film quality may not be optimal.	<None>/interact
CHECK SORTER	There is an error in the film sorter	Error in film sorter.	<None>/interact
CHEMICALS EMPTY	There are no processing chemicals in the processor, films will not be printed and processed until the processor is back to normal.	Camera chemistry empty. Please check.	<None>/interact
CHEMICALS LOW	The chemical level in the processor is low, if not corrected, it will probably shut down soon.	Camera chemistry low. Please check.	<None>/interact
COVER OPEN	One or more printer or processor covers, drawers, doors are open.	Camera cover, drawer or door open.	<None>/interact

Printer Status Info / Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI / 'camera symbol'
ELEC CONFIG ERR	Printer configured improperly for this job.	Camera configured improperly for this job. Queue stopped.	**Queue for this camera will be STOPPED/ Queue stopped**
ELEC DOWN	Printer is not operating due to some unspecified electrical hardware problem.	Camera electrical hardware Problem.	<None>/interact
ELEC SW ERROR	Printer not operating for some unspecified software error.	Camera software problem. Queue stopped.	**Queue for this camera will be STOPPED/ Queue stopped**
EMPTY 8X10	The 8x10 inch film supply magazine is empty.	8x10 film supply empty.	<None>/interact
EMPTY 8X10 BLUE	The 8x10 inch blue film supply magazine is empty.	8x10 blue film supply empty.	<None>/interact
EMPTY 8X10 CLR	The 8x10 inch clear film supply magazine is empty.	8x10 clear film supply empty.	<None>/interact
EMPTY 8X10 PAPR	The 8x10 inch paper supply magazine is empty.	8x10 paper supply empty.	<None>/interact
EMPTY 10X12	The 10x12 inch film supply magazine is empty.	10x12 film supply empty.	<None>/interact
EMPTY 10X12 BLUE	The 10x12 inch blue film supply magazine is empty.	10x12 blue film supply empty.	<None>/interact
EMPTY 10X12 CLR	The 10x12 inch clear film supply magazine is empty.	10x12 clear film supply empty.	<None>/interact
EMPTY 10X12 PAPR	The 10x12 inch paper supply magazine is empty.	10x12 paper supply empty.	<None>/interact
EMPTY 10X14	The 10x14 inch film supply magazine is empty.	10x14 film supply empty.	<None>/interact
EMPTY 10X14 BLUE	The 10x14 inch blue film supply magazine is empty.	10x14 blue film supply empty.	<None>/interact
EMPTY 10X14 CLR	The 10x14 inch clear film supply magazine is empty.	10x14 clear film supply empty.	<None>/interact
EMPTY 10X14 PAPR	The 10x14 inch paper supply magazine is empty.	10x14 paper supply empty.	<None>/interact
EMPTY 11X14	The 11x14 inch film supply magazine is empty.	11x14 film supply empty.	<None>/interact
EMPTY 11X14 BLUE	The 11x14 inch blue film supply magazine is empty.	11x14 blue film supply empty.	<None>/interact
EMPTY 11X14 CLR	The 11x14 inch clear film supply magazine is empty.	11x14 clear film supply empty.	<None>/interact
EMPTY 11X14 PAPR	The 11x14 inch paper supply magazine is empty.	11x14 paper supply empty.	<None>/interact
EMPTY 14X14	The 14x14 inch film supply magazine is empty.	14x14 film supply empty.	<None>/interact
EMPTY 14X14 BLUE	The 14x14 inch blue film supply magazine is empty.	14x14 blue film supply empty.	<None>/interact
EMPTY 14X14 CLR	The 14x14 inch clear film supply magazine is empty.	14x14 clear film supply empty.	<None>/interact
EMPTY 14X14 PAPR	The 14x14 inch paper supply magazine is empty.	14x14 paper supply empty.	<None>/interact
EMPTY 14X17	The 14x17 inch film supply magazine is empty.	14x17 film supply empty.	<None>/interact
EMPTY 14X17 BLUE	The 14x17 inch blue film supply magazine is empty.	14x17 blue film supply empty.	<None>/interact
EMPTY 14X17 CLR	The 14x17 inch clear film supply magazine is empty.	14x17 clear film supply empty.	<None>/interact
EMPTY 14X17 PAPR	The 14x17 inch paper supply magazine is empty.	14x17 paper supply empty.	<None>/interact
EMPTY 24X24	The 24x24 inch film supply magazine is empty.	24x24 film supply empty.	<None>/interact

Printer Status Info / Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI / 'camera symbol'
EMPTY 24X24 BLUE	The 24x24 inch blue film supply magazine is empty.	24x24 blue film supply empty.	<None>/interact
EMPTY 24X24 CLR	The 24x24 inch clear film supply magazine is empty.	24x24 clear film supply empty.	<None>/interact
EMPTY 24X24 PAPR	The 24x24 inch paper supply magazine is empty.	24x24 paper supply empty	<None>/interact
EMPTY 24X30	The 24x30 inch film supply magazine is empty.	24x30 film supply empty.	<None>/interact
EMPTY 24X30 BLUE	The 24x30 inch blue film supply magazine is empty.	24x30 blue film supply empty.	<None>/interact
EMPTY 24X30 CLR	The 24x30 inch clear film supply magazine is empty.	24x30 clear film supply empty.	<None>/interact
EMPTY 24X30 PAPR	The 24x30 inch paper supply magazine is empty.	24x30 paper supply empty.	<None>/interact
EMPTY A4 PAPR	The A4 paper supply magazine is empty.	A4 paper supply empty	<None>/interact
EMPTY A4 TRANS	The A4 transparency supply magazine is empty.	A4 transparency supply empty.	<None>/interact
EXPOSURE FAILURE	The exposure device has failed due to some unspecified reason.	Exposure device has failed.	<None>/interact
FILM JAM	A film transport error has occurred, and a film is jammed in the printer or processor.	Film jam.	<None>/interact
FILM TRANSP ERR	There is a malfunction with the film transport, there may or may not be a film jam.	Film transport problem.	<None>/interact
FINISHER EMPTY	The finisher is empty.	Finisher is empty.	<None>/interact
FINISHER ERROR	The finisher is not operating due to some unspecified reason	Finisher problem.	<None>/interact
FINISHER LOW	The finisher is low on supplies.	Finisher low.	<None>/interact
LOW 8X10	The 8x10 inch film supply magazine is low.	8x10 film supply low.	<None>/interact
LOW 8X10 BLUE	The 8x10 inch blue film supply magazine is low.	8x10 blue film supply low.	<None>/interact
LOW 8X10 CLR	The 8x10 inch clear film supply magazine is low.	8x10 clear film supply low.	<None>/interact
LOW 8X10 PAPR	The 8x10 inch paper supply magazine is low.	8x10 paper supply low.	<None>/interact
LOW 10X12	The 10x12 inch film supply magazine is low.	10x12 film supply low.	<None>/interact
LOW 10X12 BLUE	The 10x12 inch blue film supply magazine is low.	10x12 blue film supply low.	<None>/interact
LOW 10X12 CLR	The 10x12 inch clear film supply magazine is low.	10x12 clear film supply low.	<None>/interact
LOW 10X12 PAPR	The 10x12 inch paper supply magazine is low.	10x12 paper supply low.	<None>/interact
LOW 10X14	The 10x14 inch film supply magazine is low.	10x14 film supply low.	<None>/interact
LOW 10X14 BLUE	The 10x14 inch blue film supply magazine is low.	10x14 blue film supply low.	<None>/interact
LOW 10X14 CLR	The 10x14 inch clear film supply magazine is low.	10x14 clear film supply low.	<None>/interact
LOW 10X14 PAPR	The 10x14 inch paper supply magazine is low.	10x14 paper supply low.	<None>/interact
LOW 11X14	The 11x14 inch film supply magazine is low.	11x14 film supply low.	<None>/interact

Printer Status Info / Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI / 'camera symbol'
LOW 11X14 BLUE	The 11x14 inch blue film supply magazine is low.	11x14 blue film supply low.	<None>/interact
LOW 11X14 CLR	The 11x14 inch clear film supply magazine is low.	11x14 clear film supply low.	<None>/interact
LOW 11X14 PAPR	The 11x14 inch paper supply magazine is low.	11x14 paper supply low.	<None>/interact
LOW 14X14	The 14x14 inch film supply magazine is low.	14x14 film supply low.	<None>/interact
LOW 14X14 BLUE	The 14x14 inch blue film supply magazine is low.	14x14 blue film supply low.	<None>/interact
LOW 14X14 CLR	The 14x14 inch clear film supply magazine is low.	14x14 clear film supply low.	<None>/interact
LOW 14X14 PAPR	The 14x14 inch paper supply magazine is low.	14x14 paper supply low.	<None>/interact
LOW 14X17	The 14x17 inch film supply magazine is low.	14x17 film supply low.	<None>/interact
LOW 14X17 BLUE	The 14x17 inch blue film supply magazine is low.	14x17 blue film supply low.	<None>/interact
LOW 14X17 CLR	The 14x17 inch clear film supply magazine is low.	14x17 clear film supply low.	<None>/interact
LOW 14X17 PAPR	The 14x17 inch paper supply magazine is low.	14x17 paper supply low.	<None>/interact
LOW 24X24	The 24x24 inch film supply magazine is low.	24x24 film supply low.	<None>/interact
LOW 24X24 BLUE	The 24x24 inch blue film supply magazine is low.	24x24 blue film supply low.	<None>/interact
LOW 24X24 CLR	The 24x24 inch clear film supply magazine is low.	24x24 clear film supply low.	<None>/interact
LOW 24X24 PAPR	The 24x24 inch paper supply magazine is low.	24x24 paper supply low.	<None>/interact
LOW 24X30	The 24x30 inch film supply magazine is low.	24x30 film supply low.	<None>/interact
LOW 24X30 BLUE	The 24x30 inch blue film supply magazine is low.	24x30 blue film supply low.	<None>/interact
LOW 24X30 CLR	The 24x30 inch clear film supply magazine is low.	24x30 clear film supply low.	<None>/interact
LOW 24X30 PAPR	The 24x30 inch paper supply magazine is low.	24x30 paper supply low.	<None>/interact
LOW A4 PAPR	The A4 paper supply magazine is low.	A4 paper supply low.	<None>/interact
LOW A4 TRANS	The A4 transparency supply magazine is low.	A4 transparency supply low.	<None>/interact
NO RECEIVE MGZ	The film receive magazine is not available.	Film receiver not available.	<None>/interact
NO RIBBON	The ribbon cartridge needs to be replaced.	Replace ribbon cartridge.	<None>/interact
NO SUPPLY MGZ	The film supply magazine is not available.	Film supply not available.	<None>/interact
CHECK PRINTER	The printer is not ready at this time, operator intervention is required to make the printer available.	Check camera.	<None>/interact
CHECK PROC	The processor is not ready at this time, operator intervention is required to make the printer available.	Check processor.	<None>/interact
PRINTER DOWN	The printer is not operating due to some unspecified reason.	Camera down.	<None>/interact
PRINTER INIT	The printer is not ready at this time, it is expected to	Camera initializing.	<None>/Idle

Printer Status Info / Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI / 'camera symbol'
	become available without intervention. For example, it may be in a normal warm-up state.		
PRINTER OFFLINE	The printer has been disabled by an operator or service person.	Camera off-line.	<None>/interact
PROC DOWN	The processor is not operating due to some unspecified reason.	Processor down.	<None>/interact
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Processor initializing.	<None>/Idle
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.	Processor chemicals near overflow.	<None>/interact
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.	Processor chemicals overflow.	<None>/interact
QUEUED	Print job in Queue	--	<None>/Idle
RECEIVER FULL	The film receive magazine is full.	Receiver full.	<None>/interact
REQ MED NOT INST	The requested film, paper, or other media supply magazine is installed in the printer but may be available with operator intervention.	Install media supply.	<None>/interact
REQ MED NOT AVAI	The requested film, paper, or other media requested is not available on this printer.	Media supply not available on this camera. Queue stopped. Change camera.	Queue for this camera will be STOPPED/ Queue stopped
RIBBON ERROR	There is an unspecified problem with the print ribbon.	Error with print ribbon.	<None>/interact
SUPPLY EMPTY	The printer is out of film.	Camera out of film.	<None>/interact
SUPPLY LOW	The film supply is low.	Film supply low.	<None>/interact
UNKNOWN	There is an unspecified problem.	Unspecified problem with camera.	<None>/interact

9.7.2 Additional DICOM Execution Status Information

Printer Status Info and Execution Status Info are defined terms and can therefore be extended or reduced by camera manufacturers. Therefore syngo CT VB10A shall be flexible.

If any other printer status info or execution status info is received (as described in Table 182, syngo CT VB10A will react as shown in the following table:

Table 182: Additional Printer Status Information

Printer Status / Execution	Printer / Execution Status Info	Description	Message string visible in the Job status bar	Other action for syngo / camera symbol
WARNING	<any other>	<not defined status info>	Camera info: <status info>	<None>/Interact
FAILURE	<any other>	<not defined status info>	Camera info: <status info> Queue stopped.	Queue for this camera will be STOPPED/Queue stopped

Annex A: Index of Tables

Table 1: Network Services ... 2
Table 2: Media Services ... 6
Table 3: Implementation Identifying Information ... 6
Table 4: Terms and Definitions ... 13
Table 5: Number of Association Policies ... 24
Table 6: Asynchronous Nature as an Association Initiator ... 24
Table 7: Proposed Presentation Contexts for all AE and Activity “Send Verification Request” ... 25
Table 8: Accepted Presentation Contexts Table for all AE and Activity “Receive Verification Request” ... 26
Table 9: Association Policy ... 26
Table 10: Asynchronous Nature as an Association Initiator ... 27
Table 11: Proposed Presentation Contexts for Storage ... 27
Table 12: DICOM Command Response Status Handling Behavior ... 29
Table 13: DICOM Command Communication Failure Behavior ... 29
Table 14: Storage C-STORE-RSP Status ... 30
Table 15: Association Policies ... 31
Table 16: Asynchronous Nature as an Association Initiator ... 31
Table 17: Proposed Presentation Contexts for Storage Commitment ... 32
Table 18: DICOM Command Response Status Handling Behavior ... 32
Table 19: DICOM Command Communication Failure Behavior ... 33
Table 20: Presentation Context Table "Storage Commitment" ... 33
Table 21: Storage Commitment Failure Behavior ... 34
Table 22: Association Policies ... 34
Table 23: Asynchronous Nature as an Association Initiator ... 35
Table 24: Proposed Presentation Contexts for Query ... 35
Table 25: Extended Negotiation as an SCU ... 35
Table 26: DICOM Command Response Status Handling Behavior ... 36
Table 27: DICOM Command Communication Failure Behavior ... 36
Table 28: Attributes supported for Study/Series Query - SCU ... 36
Table 29: Proposed Presentation Contexts for Retrieve and Activity “Send Move Request” ... 38
Table 30: DICOM Command Response Status Handling Behavior ... 38
Table 31: DICOM Command Communication Failure Behavior ... 38
Table 32: Acceptable Presentation Contexts for “Receive Query Request” ... 39
Table 33: Extended Negotiation as an SCP ... 39
Table 34: DICOM Command Response Status Handling Behavior ... 40
Table 35: Attributes supported for Study/Series Query – SCP ... 40
Table 36: Accepted Presentation Contexts for Retrieve and Activity “MOVE SCP” ... 42
Table 37: DICOM Command Response Status Handling Behavior ... 42
Table 38: Association Policies ... 43
Table 39: Asynchronous Nature as an Association Initiator ... 43
Table 40: Proposed Presentation Contexts for Worklist ... 45
Table 41: Broad Query search keys ... 45
Table 42: Modality Worklist C-Find Return keys ... 46
Table 43: DICOM Command Response Status Handling Behavior ... 50
Table 44: DICOM Command Communication Failure Behavior ... 50
Table 45: Association Policies ... 50
Table 46: Asynchronous Nature as an Association Initiator ... 51
Table 47: Acceptable Presentation Contexts Activity “Create MPPS” ... 51
Table 48: MPPS N-CREATE-RSP Status Handling Behavior ... 52
Table 49: Attributes supported in MPPS N-CREATE-RQ ... 52
Table 50: Modality PPS Discontinuation Reasons supported ... 53
Table 51: Acceptable Presentation Contexts Activity “Update MPPS” ... 54
Table 52: MPPS N-SET-RSP Status Handling Behavior ... 54
Table 53: Attributes supported in MPPS N-SET-RQ ... 54
Table 54: Association Policies ... 55
Table 55: Asynchronous Nature as an Association Initiator ... 56
Table 56: Presentation Contexts for the Activity “Print Film” ... 57
Table 57: Attributes for the N-CREATE-RQ of the Basic Film Session ... 58
Table 58: N-CREATE-RSP Status Handling Behavior for the Basic Film Session ... 58
Table 59: Attributes for the N-CREATE-RQ of the Basic Film Session ... 59
Table 60: N-CREATE-RSP Status Handling Behavior for Basic Film Box ... 60
Table 61: N-ACTION-RSP Status Handling Behavior for Basic Film Box ... 60
Table 62: Attributes for N-SET-RQ of Basic Grayscale Image Box ... 61
Table 63: N-SET-RSP Status Handling Behavior for the Basic Grayscale Image Box SOP Class ... 61
Table 64: Attributes for N-SET-RQ of Basic Color Image Box ... 62

Table 65: N-SET-RSP Status Handling Behavior for the Color Grayscale Image Box 62
Table 66: Attributes for N-CREATE-RQ of Presentation LUT SOP Class 63
Table 67: N-CREATE-RSP Status Handling Behavior for the Presentation LUT SOP Class 63
Table 68: Attributes for N-GET-RQ of the Printer SOP Class 64
Table 69: DICOM Command Communication Failure Behavior 64
Table 70: Presentation Contexts for the Activity “Receive Printer Status Change Information” 64
Table 71: Attributes for the N-EVENT-REPORT-RSP of the Printer SOP Class 65
Table 72: Presentation Contexts for the Activity “Receive Print Job Status Information” 65
Table 73: Attributes for the N-EVENT-REPORT-RSP of the Print Job SOP Class 66
Table 74: AE Titles 67
Table 75: General Configuration Parameters 69
Table 76: Worklist Service Parameters 70
Table 77: MPPS Service Parameters 71
Table 78: Storage Service Parameters 72
Table 79: Storage Commitment Service Parameters 73
Table 80: Query/Retrieve Service Parameters 74
Table 81: Print Management Service Parameters 75
Table 82: Media Storage Service Parameters 76
Table 83: Audit Trail Collector Parameters 77
Table 84: Implementation Class/Version Name - Media Interchange 79
Table 85: Media - Application Profiles and Real-World Activities 80
Table 86: Transfer Syntaxes for supported compression (see Table 85: Media - Application Profiles and Real-World Activities) 81
Table 87: Private SOP Classes and Transfer Syntaxes for Augmented Media Profiles 82
Table 88: Single-Byte Character Sets without Code Extension 84
Table 89: Single-Byte Characters Sets with Code Extension 85
Table 90: Multi-Byte Character Sets without Code Extension 85
Table 91: Multi-Byte Character Sets with Code Extension 85
Table 92: Secure Transport Connection Profiles 87
Table 93: Application Level Confidentiality Profile attributes (standard tags) 88
Table 94: Application Level Confidentiality Profile Attributes (private tags) 95
Table 95: IOD of created CT Image SOP Instances 98
Table 96: Patient Module 99
Table 97: General Study Module 99
Table 98: Patient Study Module 100
Table 99: General Series Module – CT Image 101
Table 100: Frame of Reference Module 102
Table 101: General Equipment Module 103
Table 102: General Acquisition Module 103
Table 103: General Image Module 104
Table 104: General Reference Module 105
Table 105: Image Plane Module 106
Table 106: Image Pixel Module 106
Table 107: Contrast Bolus Module 107
Table 108: CT Image Module 108
Table 109: Multi-energy CT Image Module 113
Table 110: Overlay Plane Module 115
Table 111: VOI LUT Module 116
Table 112: SOP Common Module 116
Table 113: Extension Module 116
Table 114: IOD of created Raw Data SOP Instances 117
Table 115: General Series Module – Raw Data 117
Table 116: Acquisition Context Module – Raw Data 117
Table 117: Raw Data Module 117
Table 118: SOP Common Module – Raw Data 118
Table 119: IOD of created Secondary Capture Image SOP Instances 118
Table 120: General Series Module – Secondary Capture Image 119
Table 121: General Reference Module – Secondary Capture Image 120
Table 122: General Equipment Module – Secondary Capture Image 121
Table 123: SC Equipment Module 122
Table 124: General Image Module – Secondary Capture Image 122
Table 125: Image Pixel Module – Secondary Capture Image 123
Table 126: SC Image Module 124
Table 127: Overlay Plane Module – Secondary Capture Image 124
Table 128: SOP Common Module – Secondary Capture Image 125
Table 129: IOD of created X-Ray Radiation Dose Report SOP Instances 126

Table 130: Enhanced General Equipment Module 127
Table 131: SR Document Series Module - X-Ray Radiation Dose SR 127
Table 132: SR Document General Module- X-Ray Radiation Dose SR 128
Table 133: SR Document Content Module – X-Ray Radiation Dose SR 128
Table 134: SOP Common Module - X-Ray Radiation Dose SR 129
Table 135: IOD of created Enhanced SR SOP Instances 129
Table 136: General Equipment Module – Enhanced SR 130
Table 137: SR Document General Module - Enhanced SR 131
Table 138: SR Document Content Module - Enhanced SR " 132
Table 139: SR Document Series Module 132
Table 140: SOP Common Module - Enhanced SR 133
Table 141: IOD of created Comprehensive SR SOP Instances 133
Table 142: Patient Module 133
Table 143: General Study Module 134
Table 144: General Equipment Module – Comprehensive SR 134
Table 145: SR Document General Module - Comprehensive SR 134
Table 146: SR Document Series Module - Comprehensive SR 135
Table 147: SR Document Content Module - Comprehensive SR 135
Table 148: SOP Common Module - Comprehensive SR 136
Table 149: IOD of created Spatial Registration SOP Instances 136
Table 150: Frame of Reference Module 136
Table 151: General Series Module 137
Table 152: Spatial Registration Module 138
Table 153: Common Instance Reference Module 139
Table 154: SOP Common Module – Spatial Registration 139
Table 155: IOD of created RT Structure Set SOP Instances 139
Table 156: RT Series Module 140
Table 157: Structure Set Module 140
Table 158: RT Contour Module 141
Table 159: RT ROI Observations Module 141
Table 160: Approval Module 141
Table 161: SOP Common Module – RT Structure Set 142
Table 162: IOD of created Surface Segmentation SOP Instances 142
Table 163: Segmentation Series Module 142
Table 164: Surface Segmentation Module 143
Table 165: Surface Mesh Module 144
Table 166: SOP Common Module – Surface Segmentation 145
Table 167: Private Data Element Dictionary 146
Table 168: CT Radiation Dose (TID 10011) 163
Table 169: Observer Context (TID 1002, with includes from TID 1004) 164
Table 170: CT Accumulated Dose Data (TID 10012) 164
Table 171: CT Irradiation Event Data (TID 10013) 165
Table 172: Scanning Length (TID 10014) 166
Table 173: CT Dose Check Details (TID 10015) 167
Table 174: Person Participant (TID 1020) 167
Table 175: Device Participant (TID 1021) 168
Table 176: CT Examination SR 168
Table 177: Private Code definitions (Coding Scheme 99CT_SOMX) 171
Table 178: Standard Extensions of CT Image 173
Table 179: Standard Extensions of Secondary Capture Image 173
Table 180: Standard Extensions of Segmentation 173
Table 181: Common Printer Status Information 174
Table 182: Additional Printer Status Information 179

Annex B: Table of Figures

Figure 1: syngo CT VB10A DICOM Data Flow diagram 19
Figure 2: Sequence Diagram - System Configuration Workflow 21
Figure 3: Sequence Diagram - Acquisition workflow 22
Figure 4: Printing 23
Figure 5: Media Interchange Application Data Flow Diagram 78
Figure 6: Sequence diagram – Media creation and import 79

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Published by Siemens Healthineers ·Doc-Ident. **11594610** *-EKL-YKO·* ©*Siemens Healthineers CT, 2024*